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APRIL 1944

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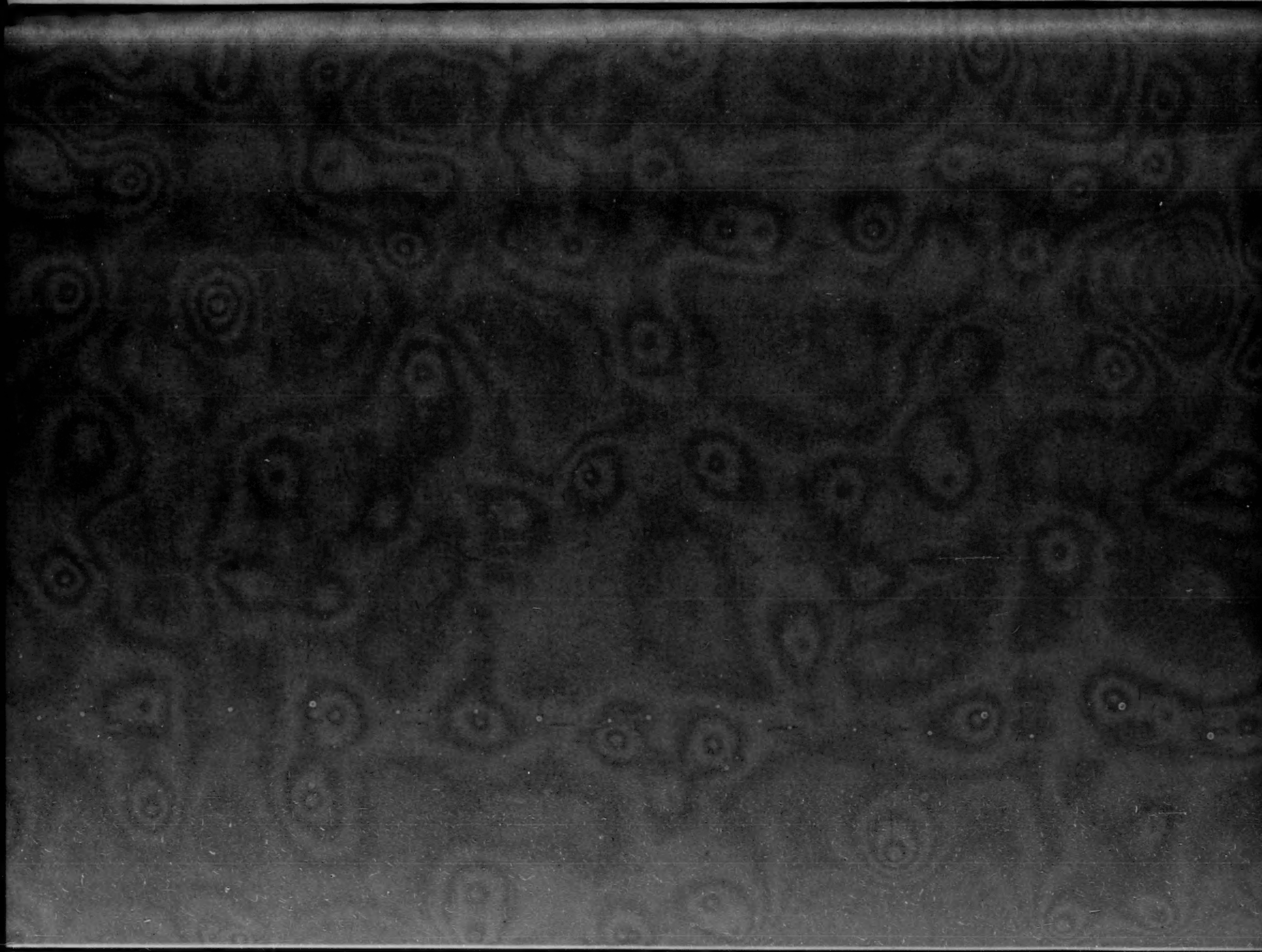

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NOTE ON ADVECTIVE PRESSURE CHANGES

By LT. (jg) ROBERT D. ELLIOTT, U. S. N. R.

MANY of the recent contributions to weather analysis and forecasting have involved a consideration of the pressure-tendency component that is due to horizontal advection in the lower levels. This is particularly true in the case of methods for computing the 3-km. pressure tendency from the surface tendency. The present note deals with a simple scheme for finding this particular component.

Analysis and forecast procedures are often based principally upon the surface chart and one upper-level chart, e.g., the 3-km. chart. Indeed, the use of the surface chart with an upper-level chart superimposed upon it in some not too conspicuous manner is quite convenient. Assuming that we have the data available in some such form, the following procedure should prove to be an easy way to compute the effects of horizontal advection between the surface and the adopted upper level without having to use the temperature pattern.

There is considerable agreement among meteorologists that the horizontal advection effects in the lower layers are much more important than the divergence and vertical motion effects, and therefore contribute the most important part of the total pressure tendency due to processes in the lower layers.

From J. Bjerknes' pressure-tendency equation, we have for the horizontal advective pressure-tendency component at any level h,

$$\left(\frac{\partial p}{\partial t}\right)_h = -\int_h^\infty g\boldsymbol{V}\cdot\nabla_2\rho dz. \tag{1}$$

The pressure change at the surface due to advection between the surface (s) and an upper level (u) is therefore

$$\left(\frac{\partial p}{\partial t}\right)_s^u = \int_s^u \boldsymbol{V}\cdot\nabla_2(-g\rho)dz$$

which, by using the hydrostatic equation $\partial p/\partial z = -g\rho$, and interchanging the order of the differentiations, may be written

$$\left(\frac{\partial p}{\partial t}\right)_s^u = \int_s^u \boldsymbol{V}\cdot d(\nabla_2 p) = \boldsymbol{V}_m\cdot\nabla_2(p_u - p_s), \tag{2}$$

in which $\boldsymbol{V}_m$ is the mean velocity between (s) and (u) with respect to the horizontal pressure gradient. Except under unusual conditions, the wind may be considered represented with sufficient accuracy by the geostrophic wind

$$\boldsymbol{V}_G = -\frac{\alpha}{l}\nabla_2 p\times\boldsymbol{k},$$

where $\boldsymbol{k}$ is a unit vertical vector, α the specific volume, and l the Coriolis parameter; and as a preliminary approximation we may take

$$\boldsymbol{V}_m = \frac{1}{2}(\boldsymbol{V}_s + \boldsymbol{V}_u).$$

The result of substituting these expressions into (2) will be the more accurate, the more nearly $\mathbf{V}_G$ varies linearly with height; the expression obtained is

$$\left(\frac{\partial p}{\partial t}\right)_s^u = U_u\left(\frac{\partial p}{\partial x}\right)_s - V_u\left(\frac{\partial p}{\partial y}\right)_s \tag{3}$$

where

$$U_u = \frac{\alpha_s+\alpha_u}{2l}\left(\frac{\partial p}{\partial y}\right)_u,\quad V_u = \frac{\alpha_s+\alpha_u}{2l}\left(\frac{\partial p}{\partial x}\right)_u.$$

One may interpret equation (3) as follows: The upper-level isobars "steer" the lower-level (surface) isobars with a velocity which equals that of the geostrophic wind computed from the upper-level isobaric pattern on the assumption that the specific volume at that level is the arithmetic mean of the values at the two levels.

Although the geostrophic wind has been used in the above discussion, it may be that the use of the gradient wind would give better results in computing the steering effect; a more accurate expression for $\mathbf{V}_m$ might also be derived. A study along these lines would be of considerable interest and value but is too complex to treat in this paper.

Some extensions of this idea might also be possible; e. g., if a series of charts for various levels were to be used, the effects of horizontal advection could be summed up for the whole column above the surface by allowing each level to steer the next lower level. The greater the number of working levels, the greater the accuracy.

It is well to point out that above about three kilometers the pressure patterns at successive levels vary comparatively little from one another, yet good pressure tendencies are observed at these upper levels. The author interprets this to mean that at these higher levels the other terms in the tendency equation are of greater importance.

METEOROLOGICAL AND CLIMATOLOGICAL DATA FOR APRIL 1944

[Climate and Crop Weather Division, J. B. KINCER, in charge]

AEROLOGICAL OBSERVATIONS

NOTICE.—RAOB tabular data for March 1944 (table 1) are shown hereunder; those for April 1944 follow—EDITOR

TABLE 1.—*Mean free-air barometric pressure in millibars, temperature in degrees centigrade, and relative humidities in percent, obtained by radiosondes during March 1944*

STATIONS AND ELEVATIONS IN METERS ABOVE SEA LEVEL

Altitude (meters) m. s. l.	Albany, N. Y. (86 m.)				Albuquerque, N. Mex. (1,620 m.)				Apalachicola, Fla. (5 m.)				Atlanta, Ga. (300 m.)				Big Spring, Tex. (774 m.)				Bismarck, N. Dak. (505 m.)				Boise, Idaho (868 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	31	1,008	−2.2	72	31	834	7.6	34	31	1,017	16.8	88	31	983	10.7	71	31	924	12.2	48	31	956	−7.7	83	29	918	3.7	59
500	31	957	−3.4	67	----	----	----	----	31	960	15.9	67	31	960	11.2	63	----	----	----	----	----	----	----	----	----	----	----	----
1,000	31	898	−5.4	69	----	----	----	----	31	905	13.5	57	31	904	9.6	62	31	900	12.9	45	31	897	−8.9	79	29	904	5.3	51
1,500	31	843	−6.1	68	----	----	----	----	31	853	11.1	50	31	851	7.2	60	31	848	10.9	37	31	841	−9.3	72	29	850	2.0	49
2,000	31	790	−7.3	64	31	796	5.9	32	31	802	8.5	43	31	800	5.2	52	31	798	8.4	34	31	788	−10.3	67	29	798	−2.1	56
2,500	30	741	−8.8	62	31	749	2.3	36	31	755	6.1	44	30	752	2.9	49	31	750	4.7	33	31	738	−12.2	60	29	749	−5.5	57
3,000	30	694	−10.7	61	31	703	−1.8	40	31	710	3.7	37	29	707	0.3	45	31	706	1.0	30	31	691	−14.5	61	29	703	−9.0	58
4,000	30	609	−15.2	56	31	619	−9.6	50	30	628	−1.8	34	26	623	−4.9	38	31	622	−6.0	32	30	605	−20.3	56	29	616	−15.2	53
5,000	30	533	−20.3	51	30	543	−16.8	56	30	553	−7.8	34	26	548	−10.9	35	31	547	−12.9	34	30	528	−26.5	56	29	539	−21.6	49
6,000	30	465	−26.8	45	27	475	−22.8	43	30	485	−14.4	37	26	480	−17.7	40	31	479	−19.8	34	29	459	−32.8	62	28	470	−27.2	42
7,000	29	404	−33.6	49	27	414	−30.4	44	30	425	−21.7	43	25	419	−25.1	44	31	418	−27.1	41	29	397	−40.0	----	28	408	−34.1	----
8,000	29	350	−40.0	----	21	358	−38.4	----	30	369	−29.1	46	24	365	−32.6	----	31	362	−34.6	49	25	342	−47.3	----	27	354	−40.2	----
9,000	29	301	−46.4	----	21	308	−45.6	----	30	320	−37.0	----	23	315	−40.3	----	30	313	−41.9	----	17	293	−52.3	----	24	305	−46.7	----
10,000	29	259	−50.6	----	13	266	−50.8	----	28	277	−44.4	----	18	273	−47.6	----	28	270	−49.1	----	7	248	−54.3	----	20	261	−51.9	----
11,000	28	222	−53.1	----	8	228	−56.2	----	27	238	−51.5	----	15	234	−54.4	----	25	231	−55.0	----	----	----	----	----	19	224	−55.3	----
12,000	22	191	−55.4	----	----	----	----	----	14	205	−55.8	----	12	199	−58.0	----	22	197	−58.6	----	----	----	----	----	16	191	−57.0	----
13,000	15	162	−52.0	----	----	----	----	----	----	----	----	----	7	169	−57.9	----	16	168	−58.4	----	----	----	----	----	13	162	−55.3	----
14,000	10	138	−52.8	----	----	----	----	----	----	----	----	----	----	----	----	----	10	143	−59.0	----	----	----	----	----	10	138	−54.2	----
15,000	7	118	−54.8	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	8	118	−54.6	----

Altitude (meters) m. s. l.	Brownsville, Tex. (6 m.)				Buffalo, N. Y. (221 m.)				Caribou, Maine (191 m.)				Charleston, S. C.[3] (14 m.)				Denver, Colo. (1,616 m.)				Dodge City, Kans. (787 m.)				El Paso, Tex. (1,195 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	31	1,013	19.4	84	31	991	−2.1	78	25	992	−8.9	74	30	1,017	12.4	88	29	834	−0.5	67	31	922	2.2	79	29	879	13.7	29
500	31	956	17.2	77	31	957	−3.1	75	25	953	−8.7	65	30	960	13.4	71	----	----	----	----	----	----	----	----	----	----	----	----
1,000	31	902	15.4	60	31	898	−4.6	69	25	893	−10.6	65	30	904	11.5	61	----	----	----	----	31	899	2.6	68	----	----	----	----
1,500	31	850	14.2	47	31	843	−6.1	69	25	837	−11.8	65	30	852	9.6	56	----	----	----	----	31	845	1.8	55	29	848	13.0	26
2,000	31	801	12.5	38	31	790	−7.5	69	25	784	−11.8	60	30	802	7.1	53	29	794	−0.6	58	31	794	0.8	45	29	798	9.1	29
2,500	31	754	9.8	35	31	741	−9.2	67	25	734	−14.1	58	30	754	5.0	48	29	746	−3.4	56	31	745	−2.0	48	29	751	5.1	34
3,000	31	710	6.6	35	31	694	−11.1	63	25	687	−16.1	53	30	709	2.5	48	29	700	−6.3	57	31	700	−4.7	48	29	706	1.4	37
4,000	31	628	−0.2	37	31	608	−15.4	54	25	601	−20.5	54	29	626	−3.0	42	29	615	−13.3	63	31	615	−11.2	53	29	623	−5.7	45
5,000	31	553	−7.5	34	31	532	−21.2	57	25	524	−26.0	49	26	551	−8.9	42	29	539	−20.2	58	31	539	−18.6	56	29	548	−12.6	41
6,000	31	486	−14.6	29	31	464	−27.2	54	25	458	−32.1	50	26	484	−15.6	42	28	470	−27.2	59	31	471	−25.7	51	29	479	−19.6	38
7,000	31	425	−21.9	30	31	403	−34.0	53	25	395	−38.2	----	22	424	−22.4	41	28	408	−35.0	58	30	410	−32.4	54	29	418	−27.4	46
8,000	30	370	−29.6	36	31	348	−40.2	----	24	341	−44.2	----	20	369	−30.1	42	26	353	−42.2	----	30	354	−39.5	----	29	362	−35.1	----
9,000	30	320	−37.2	----	28	301	−45.9	----	24	298	−49.2	----	18	320	−37.2	60	20	303	−49.2	----	30	306	−46.3	----	29	313	−42.6	----
10,000	29	277	−44.5	----	25	258	−51.0	----	23	251	−51.3	----	16	277	−44.7	----	21	259	−53.6	----	29	263	−52.3	----	24	269	−49.5	----
11,000	26	238	−50.9	----	20	221	−53.6	----	18	215	−50.7	----	11	238	−51.9	----	15	221	−54.9	----	27	225	−56.0	----	13	231	−54.6	----
12,000	21	204	−55.2	----	12	190	−53.8	----	16	184	−50.1	----	5	203	−56.6	----	11	189	−51.5	----	24	192	−55.6	----	9	197	−57.9	----
13,000	18	174	−57.1	----	8	162	−52.3	----	11	157	−48.4	----	----	----	----	----	8	163	−52.2	----	20	164	−54.8	----	----	----	----	----
14,000	10	149	−60.6	----	----	----	----	----	6	136	−50.5	----	----	----	----	----	6	139	−53.9	----	13	141	−55.3	----	----	----	----	----
15,000	8	127	−64.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	5	120	−58.7	----	----	----	----	----
16,000	5	108	−67.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

Altitude (meters) m. s. l.	Ely, Nev.[3] (1,908 m.)				Glasgow, Mont. (648 m.)				Great Falls, Mont. (1,128 m.)				Greensboro, N. C. (273 m.)				Hatteras, N. C. (3 m.)				Huntington, W. Va. (172 m.)				Int'l Falls, Minn. (343 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	31	807	−0.4	66	31	940	−6.0	79	31	885	−3.7	70	30	986	6.4	74	29	1,020	10.2	82	31	997	4.3	79	31	974	−7.5	76
500	----	----	----	----	----	----	----	----	----	----	----	----	30	959	7.7	64	29	961	10.5	62	31	958	5.1	67	31	955	−7.5	73
1,000	----	----	----	----	31	899	−6.7	79	----	----	----	----	30	903	6.2	59	29	905	8.2	58	31	901	3.0	66	31	895	−10.4	78
1,500	----	----	----	----	31	843	−7.9	73	31	845	−3.6	60	30	850	3.6	57	29	852	6.4	49	31	847	0.9	65	31	838	−12.1	82
2,000	31	708	+0.2	66	31	790	−9.1	70	31	792	−6.2	63	30	798	2.2	55	29	801	4.5	43	31	795	−1.1	61	31	785	−13.3	76
2,500	31	749	−2.5	64	31	740	−11.3	68	31	743	−9.1	67	30	750	0.4	47	29	753	2.6	40	31	746	−3.2	56	31	735	−15.1	69
3,000	31	703	−6.1	64	31	694	−13.8	63	31	696	−11.8	69	30	705	−2.2	43	29	708	0.0	42	31	701	−5.5	56	31	688	−17.1	64
4,000	31	618	−12.7	64	31	607	−19.7	65	31	610	−17.7	68	29	621	−7.3	36	29	624	−4.9	37	31	616	−10.6	48	31	601	−22.2	61
5,000	31	542	−18.5	62	31	530	−26.3	62	31	533	−24.3	67	29	545	−12.9	34	27	548	−10.9	37	31	540	−16.6	45	31	524	−28.2	56
6,000	31	473	−24.9	56	31	461	−33.1	72	29	464	−31.8	67	29	477	−19.0	40	26	481	−17.4	37	29	473	−22.4	45	30	455	−34.7	60
7,000	31	411	−31.9	52	31	398	−39.8	----	29	401	−39.0	----	29	416	−26.4	44	26	420	−24.5	42	28	412	−28.7	51	28	394	−41.0	----
8,000	30	356	−39.0	48	31	343	−46.6	----	27	346	−45.7	----	29	362	−33.8	----	25	365	−31.9	53	27	358	−35.2	59	23	339	−46.9	----
9,000	28	306	−46.0	----	31	294	−51.6	----	27	298	−51.1	----	26	314	−41.1	----	25	316	−39.6	----	26	309	−41.9	----	17	292	−51.5	----
10,000	24	261	−52.1	----	29	252	−53.9	----	25	255	−53.6	----	26	270	−48.1	----	24	273	−47.1	----	26	266	−48.5	----	11	249	−52.3	----
11,000	22	226	−56.4	----	25	218	−53.4	----	21	218	−54.7	----	23	233	−54.3	----	22	234	−54.0	----	24	229	−53.8	----	9	213	−50.9	----
12,000	20	193	−59.1	----	23	186	−51.8	----	13	185	−53.6	----	19	199	−57.4	----	18	200	−57.5	----	19	195	−55.3	----	6	183	−49.9	----
13,000	19	164	−59.2	----	17	160	−50.6	----	9	158	−51.4	----	17	170	−58.5	----	16	171	−57.4	----	18	167	−54.6	----	----	----	----	----
14,000	17	140	−58.7	----	12	137	−51.5	----	6	135	−51.7	----	17	144	−59.8	----	12	146	−58.8	----	14	143	−55.8	----	----	----	----	----
15,000	11	119	−60.1	----	6	116	−52.9	----	----	----	----	----	8	124	−61.9	----	6	124	−63.7	----	10	122	−57.9	----	----	----	----	----
16,000	6	101	−62.8	----	----	----	----	----	----	----	----	----	5	106	−63.8	----	5	106	−65.6	----	6	105	−56.6	----	----	----	----	----

TABLE 1.—*Mean free-air barometric pressure in millibars, temperature in degrees centigrade, and relative humidities in percent, obtained by radiosondes during March 1944*—Continued

STATIONS AND ELEVATIONS IN METERS ABOVE SEA LEVEL—Continued

	Joliet, Ill. (178 m.)				Lake Charles, La. (5 m.)				Lakehurst, N. J.[1] (39 m.)				Little Rock, Ark. (79 m.)				Louisville, Ky. (166 m.)				Mazatlan, Mexico (80 m.)				Medford, Oreg.[2] (409 m.)			
Surface	27	994	−0.8	84	31	1015	15.6	82	27	1015	2.0	65	31	1006	10.3	75	31	997	5.4	70	31	1006	18.6	84	31	972	10.0	56
500	27	955	−1.4	78	31	958	14.4	65	27	958	1.4	56	31	957	9.7	65	31	957	4.3	67	31	958	19.6	38	31	962	10.0	57
1,000	27	896	−3.1	74	31	903	12.2	55	27	901	−0.3	55	31	901	7.7	65	31	900	2.4	66	31	903	18.2	27	31	905	7.1	57
1,500	26	842	−4.5	64	31	851	10.2	48	27	846	−1.7	54	31	848	5.5	68	31	846	1.1	64	31	852	15.3	26	31	852	3.6	60
2,000	26	790	−6.0	60	31	800	8.3	41	27	794	−3.7	54	31	797	3.4	62	31	795	−0.8	56	31	803	12.4	26	31	800	0.2	61
2,500	26	740	−7.9	56	31	754	6.0	40	26	745	−5.6	53	31	749	1.2	60	31	746	−3.2	54	31	756	9.4	26	31	751	−2.7	59
3,000	26	694	−10.4	56	31	708	3.3	38	26	699	−7.7	51	31	704	−1.4	58	31	700	−5.6	51	31	711	6.0	29	31	705	−5.2	56
4,000	26	609	−15.8	52	31	626	−3.0	36	26	614	−12.4	48	29	621	−7.2	52	31	616	−11.2	47	30	629	−0.5	29	30	620	−10.7	49
5,000	23	532	−21.8	58	31	550	−9.7	31	26	538	−18.3	45	27	545	−13.3	49	31	540	−16.6	45	30	554	−7.0	31	30	544	−16.2	47
6,000	23	464	−28.2	62	31	483	−16.6	36	25	471	−24.3	45	27	477	−19.5	45	31	472	−22.6	44	29	487	−14.5	33	30	476	−22.7	45
7,000	22	402	−34.8	63	31	422	−23.8	40	24	410	−30.8	49	27	416	−26.9	46	31	411	−29.3	47	28	426	−21.8	----	29	414	−30.1	44
8,000	22	348	−41.3	----	31	367	−31.3	45	18	356	−37.4	----	27	361	−34.3	----	28	357	−36.2	----	28	371	−29.6	----	27	359	−37.3	----
9,000	21	300	−47.1	----	31	318	−38.7	----	15	308	−44.9	----	25	312	−41.1	----	27	309	−43.0	----	28	322	−37.6	----	27	309	−44.4	----
10,000	18	258	−52.0	----	31	274	−45.7	----	12	266	−51.2	----	24	270	−47.8	----	20	267	−48.8	----	26	278	−44.6	----	27	266	−51.3	----
11,000	15	222	−54.5	----	30	236	−52.4	----	5	230	−57.0	----	12	234	−53.2	----	13	231	−54.8	----	7	240	−47.6	----	22	228	−57.2	----
12,000	10	191	−55.1	----	28	201	−56.8	----					5	200	−56.0	----	5	197	−57.1	----					15	195	−60.0	----
13,000	9	163	−52.9	----	24	172	−57.4	----																	14	165	−58.9	----
14,000					23	146	−60.2	----																	12	141	−58.2	----
15,000					21	125	−63.8	----																	8	121	−58.6	----
16,000					12	106	−66.0	----																				

	Miami, Fla.[2] (4 m.)				Nashville, Tenn. (180 m.)				Norfolk, Va.[1] (4 m.)				Oakland, Calif. (2 m.)				Ogden, Utah (1,355 m.)				Oklahoma City, Okla. (391 m.)				Omaha, Nebr. (301 m.)			
Surface	31	1,018	21.2	81	31	996	8.8	68	27	1,018	8.7	75	31	1,018	12.8	64	31	864	1.4	69	30	968	8.2	71	31	980	0.1	81
500	31	962	19.6	76	31	958	8.0	60	27	959	7.8	61	31	959	11.5	49	----	----	----	----	30	955	8.6	65	31	956	−1.1	79
1,000	31	907	16.7	73	31	901	5.9	60	27	903	6.4	58	31	904	9.6	39	----	----	----	----	30	900	7.0	62	31	898	−3.4	78
1,500	31	855	13.7	75	31	848	3.8	60	26	850	4.8	53	31	850	6.7	34	31	849	1.4	62	29	847	5.8	58	31	843	−4.1	64
2,000	31	806	11.2	70	31	797	1.9	52	26	798	3.0	51	31	800	3.7	34	31	797	−1.5	58	29	796	3.8	52	31	791	−5.4	62
2,500	31	759	9.3	55	31	749	−0.5	51	26	750	0.8	47	31	752	0.9	34	31	748	−5.1	66	29	748	1.3	49	31	742	−7.3	58
3,000	31	714	7.0	51	31	703	−3.1	47	26	705	−1.8	46	31	706	−1.5	33	31	702	−8.6	73	29	703	−1.9	46	31	696	−9.6	51
4,000	30	632	2.0	45	29	619	−8.3	43	24	621	−6.8	40	31	622	−7.4	36	31	616	−14.7	67	29	619	−8.4	41	31	610	−15.3	53
5,000	30	557	−3.8	36	28	544	−14.3	47	20	546	−13.6	31	30	546	−13.8	37	31	539	−20.9	59	28	544	−15.0	38	31	534	−21.3	51
6,000	30	490	−10.2	33	28	476	−20.4	43	19	478	−19.9	28	30	478	−20.5	41	31	470	−27.7	61	28	476	−21.9	38	30	466	−28.5	57
7,000	30	430	−17.2	32	28	415	−27.5	40	17	416	−27.0	34	30	417	−27.8	44	31	408	−34.9	58	28	414	−29.2	41	30	404	−35.6	49
8,000	28	376	−24.8	33	27	360	−35.1	----	13	360	−35.0	----	30	362	−35.5	51	30	352	−42.3	----	28	359	−36.3	----	30	349	−41.7	----
9,000	27	326	−32.9	32	25	312	−42.1	----	12	310	−42.9	----	30	312	−43.3	----	29	303	−48.7	----	28	310	−43.2	----	30	300	−47.5	----
10,000	22	283	−40.4	----	15	270	−48.7	----	8	269	−50.4	----	29	269	−50.7	----	29	260	−53.2	----	27	267	−49.6	----	30	258	−52.3	----
11,000	21	244	−47.6	----	8	232	−54.8	----	6	231	−57.0	----	29	230	−56.6	----	29	223	−55.0	----	25	229	−54.6	----	28	221	−54.2	----
12,000	14	210	−54.0	----					5	197	−60.1	----	27	197	−60.9	----	27	190	−55.6	----	24	196	−57.2	----	23	189	−53.6	----
13,000	10	179	−57.1	----									25	167	−62.0	----	25	163	−55.5	----	23	167	−56.2	----	18	161	−52.6	----
14,000	9	153	−61.5	----									24	142	−60.3	----	22	139	−56.7	----	20	143	−57.0	----	13	138	−52.8	----
15,000	6	131	−67.2	----									20	121	−61.4	----	16	119	−57.6	----	14	122	−59.8	----	9	119	−54.3	----
16,000	5	111	−72.9	----									18	108	−63.7	----	10	102	−59.4	----	10	104	−62.9	----				
17,000													14	88	−65.2	----												
18,000													5	75	−66.1	----												

	Phoenix, Ariz. (339 m.)				Pittsburgh, Pa. (392 m.)				Portland, Maine[2] (20 m.)				Rapid City, S. Dak. (981 m.)				St. Louis, Mo. (171 m.)				St. Paul, Minn. (225 m.)				San Antonio, Tex. (242 m.)			
Surface	31	973	14.0	51	30	970	1.7	71	31	1,015	−2.1	74	31	902	−5.6	89	31	996	4.6	71	31	989	−2.8	79	31	986	15.7	76
500	31	955	16.6	35	30	956	1.7	69	31	955	−3.9	72	----	----	----	----	31	956	3.3	67	31	954	−4.4	80	31	956	15.2	72
1,000	31	900	13.3	32	30	899	−0.1	71	31	897	−5.8	68	31	899	−5.2	88	31	899	1.7	65	31	896	−7.4	83	31	902	13.0	71
1,500	31	848	9.4	35	30	845	−1.8	64	31	841	−7.1	66	31	844	−5.4	72	31	845	0.3	62	31	840	−8.4	78	31	850	10.8	62
2,000	31	798	5.2	38	30	793	−3.7	63	31	789	−8.2	62	31	791	−7.3	68	31	793	−1.9	56	31	787	−9.2	74	31	800	9.3	42
2,500	31	750	1.5	40	29	744	−5.9	63	31	739	−9.7	62	31	742	−9.1	65	31	744	−4.2	55	31	738	−11.3	70	31	753	6.7	36
3,000	31	705	−1.9	38	29	697	−7.8	55	31	693	−11.7	61	31	695	−11.7	68	31	698	−6.9	55	31	691	−13.4	69	31	708	3.8	33
4,000	31	621	−7.8	37	29	613	−13.0	58	30	608	−15.9	60	31	609	−17.7	72	31	613	−12.5	56	31	605	−18.9	60	31	626	−2.7	32
5,000	31	545	−14.0	37	29	536	−19.4	51	30	532	−20.9	59	31	532	−24.5	68	31	538	−18.5	60	31	529	−24.7	64	31	550	−8.9	34
6,000	31	477	−21.0	42	29	468	−25.1	52	30	464	−27.2	57	30	463	−31.8	69	31	470	−24.6	51	30	462	−31.2	57	31	483	−15.7	38
7,000	31	416	−28.9	47	29	407	−31.6	50	30	403	−33.9	58	30	401	−38.9	----	31	408	−31.8	48	30	398	−38.3	----	31	422	−23.3	40
8,000	30	360	−36.8	----	29	353	−38.1	----	26	349	−40.5	----	29	345	−45.7	----	29	354	−37.8	----	28	345	−44.7	----	31	367	−30.9	44
9,000	30	311	−44.1	----	29	304	−44.8	----	24	300	−46.4	----	27	296	−51.1	----	26	306	−44.9	----	22	296	−50.0	----	30	318	−38.5	----
10,000	30	267	−50.5	----	24	262	−50.4	----	22	258	−51.2	----	25	254	−54.5	----	14	266	−51.5	----	17	255	−52.6	----	30	275	−45.8	----
11,000	30	229	−55.7	----	20	225	−55.5	----	17	222	−55.6	----	18	217	−54.3	----					13	218	−53.0	----	26	236	−52.0	----
12,000	28	195	−58.1	----	16	193	−58.0	----	13	188	−55.2	----	15	186	−52.1	----					6	185	−50.8	----	22	202	−56.2	----
13,000	27	167	−58.1	----	12	165	−56.6	----	7	163	−52.8	----	11	159	−51.4	----									21	172	−55.8	----
14,000	22	142	−59.0	----	6	140	−56.3	----																	20	147	−58.4	----
15,000	20	121	−60.9	----																					16	126	−62.0	----
16,000	19	103	−62.8	----																					14	107	−65.7	----
17,000	14	88	−63.5	----																					6	91	−68.3	----

	San Diego, Calif.[1] (19 m.)				San Juan, P. R. (15 m.)				Santa Maria, Calif. (71 m.)				Sault Ste. Marie, Mich.[2] (221 m.)				Seattle, Wash.[1] (22 m.)				Spokane, Wash. (598 m.)				Swan Island, West Indies (10 m.)			
Surface	25	1,013	14.8	68	31	1,016	24.0	77	31	1,009	11.7	73	31	989	−6.1	84	23	1,019	8.2	60	31	947	3.1	64	31	1,013	25.3	79
500	25	957	12.8	59	31	961	19.8	82	31	959	12.4	54	31	954	−6.8	84	23	961	4.9	59	----	----	----	----	31	958	21.9	79
1,000	25	902	10.7	56	31	907	16.0	75	31	903	10.3	43	31	895	−8.8	85	23	904	+1.2	66	31	901	2.0	50	31	904	19.1	69
1,500	25	849	8.4	57	31	855	13.3	66	31	850	7.3	42	31	838	−10.5	83	23	849	−2.3	72	31	847	−1.6	53	31	854	16.6	55
2,000	25	799	5.4	43	31	805	11.4	47	31	800	4.8	37	31	786	−12.2	81	23	796	−5.4	72	31	794	−5.2	57	31	804	14.0	48
2,500	24	752	3.4	40	31	758	9.5	29	31	752	2.3	33	31	735	−13.9	78	23	747	−8.2	69	31	745	−8.4	63	31	758	12.3	33
3,000	24	706	1.0	38	31	714	7.6	21	31	706	−0.3	28	31	688	−16.2	76	23	700	−10.6	63	31	698	−11.5	65	31	714	10.4	20
4,000	23	623	−4.6	45	31	632	3.1	----	29	623	−5.6	26	31	602	−21.2	69	23	614	−16.5	53	31	612	−17.1	53	31	632	5.2	----
5,000	22	548	−11.5	46	31	558	−2.8	----	29	548	−11.8	33	31	525	−26.6	66	21	537	−21.7	56	31	536	−22.8	46	31	558	0.0	----
6,000	19	480	−18.3	----	31	491	−9.7	----	28	480	−19.2	38	31	457	−32.4	61	20	468	−28.8	60	31	466	−29.4	48	31	492	−6.6	----
7,000	18	419	−25.7	----	30	431	−17.2	----	27	418	−26.8	42	27	396	−38.5	69	20	406	−35.4	65	31	404	−36.4	----	31	432	−13.8	----
8,000	8	364	−32.8	----	28	376	−24.6	----	23	364	−34.4	----	26	342	−44.2	----	20	350	−42.4	----	27	350	−42.1	----	31	378	−21.6	----
9,000	8	315	−40.1	----	28	326	−31.7	----	21	315	−41.9	----	23	294	−49.1	----	18	302	−48.4	----	20	303	−47.9	----	31	329	−29.4	----
10,000	7	272	−47.1	----	27	283	−38.5	----	20	271	−49.6	----	19	251	−52.5	----	16	260	−53.9	----	16	260	−53.4	----	31	286	−36.9	----
11,000	5	234	−52.6	----	25	245	−45.2	----	17	233	−57.2	----	17	216	−52.7	----	12	222	−59.8	----	8	220	−54.4	----	31	247	−44.2	----
12,000					22	210	−50.5	----	16	199	−63.2	----	8	182	−48.6	----	9	187	−61.9	----	7	187	−52.1	----	31	212	−51.8	----
13,000					8	181	−57.0	----	13	168	−62.1	----					7	160	−60.0	----	6	160	−49.9	----	28	181	−58.5	----
14,000									12	143	−60.9	----													28	154	−64.7	----
15,000									9	123	−62.4	----													28	130	−70.6	----
16,000									6	104	−64.5	----													27	110	−75.8	----
17,000																									21	93	−78.5	----
18,000																									14	78	−78.1	----
19,000																									8	66	−76.5	----

See footnotes on p. 92.

TABLE 1—*Mean free-air barometric pressure in millibars, temperature in degrees centigrade, and relative humidities in percent, obtained by radiosondes during March 1944*—Continued

STATIONS AND ELEVATIONA IN METERS ABOVE SEA LEVEL—Continued

	Tacubaya, Mexico (2,306 m.)				Tampa, Fla. (3 m.)				Tapachula, Mexico (115 m.)				Tatoosh Is., Wash. (31 m)				Toledo, Ohio (191 m.)				Tongue Point, Oreg.[1] (21 m.)				Washington, D. C. (25 m.)			
Surface	31	773	16.7	38	28	1,019	19.2	82	31	998	26.2	77	31	1018	6.4	79	30	995	−1.5	79	----	------	------	----	31	1016	5.2	65
500					28	961	17.6	72	31	955	24.1	72	31	961	3.8	73	30	957	−2.5	71	----	------	------	----	31	958	3.8	57
1,000					28	907	15.0	68	31	902	21.3	73	31	903	1.0	69	30	899	−4.0	70	----	------	------	----	31	902	1.7	57
1,500					28	855	12.1	60	31	852	18.3	79	31	849	−1.4	66	30	844	−4.6	62	----	------	------	----	31	847	0.3	59
2,000					28	805	10.0	53	31	803	15.6	80	31	796	−4.2	59	30	791	−5.8	57	----	------	------	----	31	796	−1.5	58
2,500	31	756	15.6	37	28	758	7.8	47	31	757	13.1	74	31	747	−6.6	52	30	742	−7.6	53	----	------	------	----	31	747	−3.4	54
3,000	31	712	12.0	40	27	713	5.8	39	31	713	10.4	73	31	701	−9.3	52	30	696	−9.6	53	----	------	------	----	31	701	−5.3	45
4,000	31	631	3.5	52	27	630	0.4	30	31	632	4.5	66	30	615	−14.8	55	30	610	−14.5	48	----	------	------	----	31	616	−10.2	41
5,000	31	557	−4.2	56	27	555	−6.1	33	31	558	−1.0	33	30	538	−20.7	57	30	534	−20.3	50	----	------	------	----	31	541	−16.5	41
6,000	31	490	−11.1	50	26	488	−12.5	33	31	492	−7.2	27	30	470	−26.5	57	30	466	−26.4	52	----	------	------	----	29	473	−23.1	43
7,000	31	430	−17.9	49	25	428	−19.5	33	31	432	−13.8	24	30	408	−33.3	56	30	405	−33.3	62	----	------	------	----	28	412	−29.3	43
8,000	29	375	−25.5	43	25	373	−26.8	----	31	378	−21.5	----	29	353	−40.2	----	29	350	−40.3	----	----	------	------	----	28	358	−36.3	50
9,000	28	326	−33.1	47	25	323	−34.8	----	31	329	−29.6	----	26	305	−46.4	----	28	301	−45.7	----	----	------	------	----	27	309	−43.7	----
10,000	28	283	−40.7	----	25	280	−42.7	----	31	286	−37.5	----	23	262	−52.4	----	17	257	−50.0	----	----	------	------	----	25	266	−50.5	----
11,000	23	243	−48.2	----	21	241	−49.9	----	31	246	−45.0	----	20	225	−57.5	----	13	221	−51.9	----	----	------	------	----	21	228	−55.1	----
12,000					8	208	−52.9	----	29	212	−52.1	----	16	191	−59.5	----	12	189	−53.4	----	----	------	------	----	14	195	−57.4	----
13,000									29	181	−58.7	----	11	163	−57.4	----	10	163	−53.4	----	----	------	------	----	9	167	−55.1	----
14,000									27	154	−64.6	----	6	140	−55.3	----	5	141	−53.3	----	----	------	------	----	5	142	−57.4	----
15,000									24	130	−70.9	----																
16,000									18	110	−76.2	----																
17,000									11	92	−79.4	----																
18,000									7	78	−77.7	----																

[1] U. S. Navy.
[2] Humidity data obtained by hair hygrometer, others using electric hygrometer.
[3] Insufficient observations.

Note.—All observations taken near 11:00 P. M. EST., except at Mexican stations, where they are taken near 9:00 P. M.

"Number of Observations" refers to pressure only, as temperature and humidity data are sometimes missing for some observations at certain levels. Relative humidity data are not used in daily observations when the temperature is below −40.0 °C.

None of the means included in these tables are based on less than 15 surface or 5 standard level observations. Means for observations obtained by the electric hygrometer have been adjusted to compensate for the values occurring below the operating range of the humidity element.

TABLE 1.—*Mean free-air barometric pressure in millibars, temperature in degrees Centigrade, and relative humidities in percent, obtained by radiosondes during April 1944*

STATIONS AND ELEVATIONS IN METERS ABOVE SEA LEVEL

	Albany, N. Y. (86 m.)				Albuquerque, N. Mex. (1620 m.)				Apalachicola, Fla. (5 m.)				Atlanta, Ga. (300 m.)				Big Spring, Tex. (774 m.)				Bismarck, N. Dak. (505 m.)				Boise, Idaho (868 m.)			
Surface	30	1005	4.0	71	29	833	11.5	39	30	1016	18.6	86	30	982	14.2	72	30	922	17.6	33	30	957	4.9	70	30	912	10.5	55
500	30	955	3.6	64	----	------	------	----	30	960	17.9	64	30	959	14.3	66	----	------	------	----	----	------	------	----	----	------	------	----
1,000	30	898	1.0	64	----	------	------	----	30	905	15.2	54	30	904	11.7	62	30	898	17.5	32	30	900	4.0	61	30	898	10.3	49
1,500	30	844	−1.5	66	----	------	------	----	30	853	12.6	49	30	851	9.0	55	30	847	14.7	30	30	847	0.8	65	30	845	6.6	48
2,000	30	792	−4.1	68	29	975	9.1	37	30	803	10.7	39	30	801	7.1	44	30	797	11.4	30	30	795	−1.7	66	30	794	2.7	53
2,500	30	743	−6.4	62	29	748	5.3	41	30	756	8.3	37	30	753	4.7	42	30	751	7.9	28	30	746	−4.4	59	30	747	−1.6	62
3,000	30	697	−8.5	58	29	704	1.3	44	30	711	5.4	32	30	708	1.9	40	30	706	4.1	28	30	700	−6.7	54	30	701	−5.1	65
4,000	30	612	−13.3	46	29	620	−6.9	58	30	629	−0.4	29	28	625	−3.9	39	30	624	−3.1	29	29	616	−12.2	50	30	616	−11.7	65
5,000	30	536	−19.2	41	29	545	−14.5	66	30	554	−7.1	32	28	550	−10.6	38	29	549	−10.6	29	28	540	−17.8	44	30	540	−18.2	66
6,000	30	468	−25.6	45	29	477	−21.2	56	30	487	−14.2	44	27	482	−17.0	40	29	481	−17.8	----	28	472	−24.3	50	30	472	−25.2	60
7,000	30	406	−32.5	48	29	415	−28.9	54	30	426	−20.9	45	26	420	−24.0	----	29	420	−25.4	----	28	410	−32.1	----	30	410	−33.0	64
8,000	30	352	−39.4	----	28	360	−36.6	----	30	371	−28.1	47	26	366	−31.0	----	28	365	−32.8	----	27	355	−39.6	----	28	355	−40.5	----
9,000	30	304	−45.8	----	26	311	−43.7	----	30	322	−35.6	----	23	317	−38.3	----	28	316	−40.3	----	23	306	−47.5	----	24	306	−47.9	----
10,000	29	260	−50.8	----	22	267	−49.5	----	30	279	−43.2	----	20	274	−45.6	----	28	272	−47.5	----	12	263	−55.2	----	22	262	−53.8	----
11,000	26	223	−53.3	----	15	229	−52.1	----	29	240	−50.3	----	17	236	−53.2	----	26	234	−53.6	----	----	------	------	----	20	225	−56.8	----
12,000	20	192	−55.1	----	11	197	−54.4	----	21	205	−56.6	----	10	201	−58.8	----	24	199	−57.9	----	----	------	------	----	17	192	−56.5	----
13,000	13	163	−53.6	----	9	169	−56.4	----	10	176	−60.5	----	6	170	−60.8	----	22	170	−59.7	----	----	------	------	----	8	164	−55.1	----
14,000	11	140	−53.1	----	6	144	−58.6	----									16	145	−61.7	----	----	------	------	----	5	140	−53.5	----
15,000	9	119	−54.3	----													9	123	−63.1	----	----	------	------	----				
16,000	6	102	−55.5	----													6	104	−63.1	----	----	------	------	----				

	Brownsville, Tex. (6 m.)				Buffalo, N. Y. (221 m.)				Caribou, Maine[3] (191 m.)				Charleston, S. C.[3] (14 m.)				Denver, Colo. (1,616 m.)				Dodge City, Kans. (787 m.)				El Paso, Tex. (1,195 m.)			
Surface	30	1010	22.0	84	27	989	3.4	75	----	------	------	----	30	1016	15.0	88	29	834	5.2	71	30	921	7.4	81	29	877	18.0	22
500	30	954	19.8	71	27	956	3.2	68	----	------	------	----	30	960	15.9	68	----	------	------	----	----	------	------	----	----	------	------	----
1,000	30	901	19.0	50	27	898	0.8	69	----	------	------	----	30	905	13.2	61	----	------	------	----	30	898	7.9	70	----	------	------	----
1,500	30	850	17.6	37	27	844	−1.8	70	----	------	------	----	30	852	10.6	59	----	------	------	----	30	845	5.8	66	29	847	16.5	22
2,000	30	801	16.1	29	27	792	−4.2	65	----	------	------	----	30	802	7.8	56	29	795	4.5	59	30	794	4.2	59	29	798	12.5	24
2,500	30	755	13.5	24	27	743	−6.4	58	----	------	------	----	30	754	5.7	50	29	747	1.3	59	30	747	1.9	50	29	751	8.3	28
3,000	30	711	10.8	24	27	697	−8.7	53	----	------	------	----	30	710	3.4	46	29	702	−2.3	61	30	702	−1.1	51	29	706	4.2	32
4,000	29	630	2.6	27	26	611	−14.5	52	----	------	------	----	25	626	−2.2	42	28	618	−9.6	66	30	618	−8.1	43	29	624	−3.4	31
5,000	29	556	−5.0	32	26	535	−20.4	47	----	------	------	----	24	552	−8.9	43	28	542	−16.6	58	30	543	−15.3	45	29	549	−10.7	32
6,000	28	488	−12.4	40	26	467	−26.8	43	----	------	------	----	23	485	−15.3	40	28	474	−23.9	52	30	475	−21.9	44	29	481	−17.8	31
7,000	28	428	−19.6	47	26	406	−33.9	----	----	------	------	----	23	424	−22.2	39	28	412	−31.5	----	30	413	−29.3	40	29	420	−25.1	38
8,000	28	373	−26.7	----	25	352	−40.1	----	----	------	------	----	21	369	−29.8	34	28	357	−39.5	----	29	358	−36.5	----	28	365	−32.4	----
9,000	28	324	−34.0	----	23	303	−46.7	----	----	------	------	----	19	320	−36.8	42	27	308	−46.8	----	28	310	−43.5	----	28	316	−40.1	----
10,000	27	280	−41.7	----	23	260	−51.2	----	----	------	------	----	13	278	−43.4	----	25	264	−52.8	----	28	266	−50.0	----	24	273	−47.4	----
11,000	27	241	−49.4	----	23	223	−52.9	----	----	------	------	----	9	241	−49.1	----	16	227	−55.6	----	27	228	−54.8	----	14	235	−53.0	----
12,000	27	207	−55.7	----	18	191	−52.8	----	----	------	------	----	7	207	−55.8	----	12	193	−56.0	----	27	195	−56.9	----	7	200	−55.6	----
13,000	22	177	−60.7	----	14	164	−53.4	----	----	------	------	----	5	176	−60.4	----	11	165	−55.3	----	25	167	−56.6	----	----	------	------	----
14,000	14	150	−64.3	----	10	140	−53.8	----	----	------	------	----	----	------	------	----	8	141	−55.2	----	19	142	−56.5	----	----	------	------	----
15,000									----	------	------	----	----	------	------	----	6	120	−56.2	----	13	122	−57.1	----	----	------	------	----
16,000									----	------	------	----	----	------	------	----	----	------	------	----	9	104	−58.6	----	----	------	------	----

See footnotes at end of table.

TABLE 1.—*Mean free-air barometric pressure in millibars, temperature in degrees centigrade, and relative humidities in percent, obtained by radiosondes during April 1944*—Continued

STATIONS AND ELEVATIONS IN METERS ABOVE SEA LEVEL—Continued

	Ely, Nev.[2] (1,908 m.)				Glasgow, Mont. (648 m.)				Great Falls, Mont. (1,128 m.)				Greensboro, N. C. (273 m.)				Hatteras, N. C. (3 m.)				Huntington, W. Va. (172 m.)				Int'l Falls, Minn. (343 m.)			
Surface	30	804	4.7	63	30	938	9.0	60	29	883	8.8	51	29	985	12.1	70	29	1,017	14.8	81	30	996	10.0	78	30	977	3.8	55
500													29	958	12.7	59	29	959	13.5	66	30	957	10.9	61	30	959	5.2	45
1,000					30	899	7.6	56					29	903	10.0	60	29	903	10.2	64	30	901	7.7	62	30	901	1.9	45
1,500					30	846	4.5	58	29	845	7.1	45	29	850	6.8	62	29	851	7.3	56	30	848	4.1	67	30	847	−1.8	51
2,000	30	795	4.6	62	30	793	1.2	59	29	794	3.2	49	29	800	3.9	60	29	800	4.8	47	30	797	1.0	62	30	795	−4.5	57
2,500	30	748	1.3	62	30	746	−2.3	61	29	746	−1.0	56	29	752	1.4	51	29	752	2.6	48	29	748	−0.9	52	30	746	−6.9	54
3,000	30	702	−2.5	63	30	701	−5.6	67	29	701	−5.3	66	29	706	−0.9	42	29	707	−0.2	45	28	703	−3.8	49	30	699	−9.1	50
4,000	30	618	−9.9	68	30	616	−12.1	59	29	616	−12.7	67	28	622	−6.4	39	29	623	−5.8	41	27	619	−9.2	45	30	614	−14.2	45
5,000	30	542	−16.2	67	29	540	−18.6	45	29	540	−19.1	49	28	546	−12.7	41	29	548	−11.7	38	26	543	−15.4	48	30	538	−20.1	42
6,000	29	474	−23.3	66	29	472	−25.5	46	29	471	−26.3	47	28	479	−19.3	45	29	480	−18.3	36	26	475	−22.0	46	30	469	−27.0	49
7,000	27	413	−30.7	62	29	410	−32.7	47	28	409	−33.8	48	28	418	−26.3	----	28	419	−25.3	42	26	413	−29.0	42	29	407	−34.4	----
8,000	26	358	−38.1	60	29	354	−40.3	----	28	354	−41.6	----	27	363	−33.1	----	28	364	−32.4	52	26	359	−35.4	38	29	352	−41.8	----
9,000	21	309	−45.2	----	29	305	−47.8	----	27	304	−49.0	----	27	314	−40.2	----	28	315	−39.8	----	26	310	−42.4	----	27	303	−48.4	----
10,000	17	266	−51.6	----	27	262	−55.0	----	25	261	−54.9	----	26	271	−46.7	----	26	272	−46.9	----	26	267	−48.7	----	22	260	−54.4	----
11,000	15	228	−56.2	----	24	224	−59.6	----	20	223	−57.6	----	24	233	−53.5	----	19	235	−53.7	----	26	229	−54.0	----	22	223	−57.8	----
12,000	13	193	−58.2	----	14	191	−57.9	----	13	191	−54.2	----	22	200	−58.8	----	10	199	−59.9	----	23	196	−57.2	----	18	190	−56.4	----
13,000	13	166	−57.8	----	8	163	−52.1	----	10	163	−52.4	----	22	170	−60.3	----					20	167	−57.9	----	18	162	−54.1	----
14,000	9	141	−56.5	----	5	140	−53.3	----	7	139	−53.5	----	14	145	−59.1	----					17	142	−58.2	----	17	138	−53.3	----
15,000	8	121	−57.4	----					5	120	−54.1	----	9	124	−61.1	----					9	121	−58.9	----	16	118	−54.0	----
16,000													6	106	−62.1	----					5	102	−58.6	----	13	102	−54.8	----
17,000																									9	87	−56.0	----
18,000																									7	75	−55.8	----

	Jackson, Miss. (97 m.)				Joliet, Ill. (178 m.)				Lake Charles, La. (5 m.)				Lakehurst, N. J.[1] (39 m.)				Little Rock, Ark. (79 m.)				Louisville, Ky. (166 m.)				Mazatlan, Mexico (80 m.)			
Surface	27	1,003	17.8	80	29	994	6.2	80	30	1,013	19.2	84	30	1,011	7.8	72	30	1,004	15.1	75	30	995	12.2	69	30	1,004	20.9	83
500	27	956	16.3	75	29	956	6.5	71	30	957	17.6	74	30	956	7.3	61	30	956	14.5	63	30	956	11.4	61	30	957	21.7	44
1,000	27	902	13.6	74	29	899	3.8	70	30	902	15.2	66	30	899	5.0	60	30	901	11.4	63	30	901	8.0	66	30	903	21.5	25
1,500	27	850	11.5	66	29	846	1.6	71	30	851	13.0	56	30	846	2.0	60	30	849	9.4	59	30	848	4.7	68	30	852	19.1	----
2,000	27	800	9.7	55	29	794	−0.1	61	30	801	10.9	46	30	794	−0.8	63	30	798	7.0	58	30	797	2.3	61	30	804	16.3	----
2,500	27	753	7.4	46	29	746	−2.5	62	30	755	8.9	39	30	746	−3.4	63	30	751	4.6	50	30	748	−0.2	53	30	757	13.1	----
3,000	27	709	4.8	37	29	700	−4.9	61	30	710	6.1	34	30	700	−5.9	58	30	706	1.7	47	30	703	−2.3	44	30	713	10.0	----
4,000	27	626	−1.4	36	29	617	−10.3	56	30	628	0.2	30	30	616	−11.0	54	30	623	−4.4	41	30	619	−8.1	48	27	631	3.1	----
5,000	27	552	−8.2	32	29	541	−16.1	49	30	553	−7.2	34	30	540	−16.9	53	30	548	−11.1	37	30	544	−14.2	46	26	557	−3.5	----
6,000	27	484	−15.3	----	28	474	−22.4	52	30	486	−14.5	40	30	472	−23.8	50	29	480	−18.1	38	30	476	−20.8	43	26	490	−10.7	----
7,000	27	423	−22.4	----	28	412	−30.0	55	30	425	−21.8	46	30	411	−30.2	47	28	419	−25.3	36	30	415	−28.1	----	26	430	−18.2	----
8,000	27	368	−29.8	----	28	357	−37.4	----	30	370	−29.1	45	26	356	−36.6	----	27	364	−32.5	----	30	360	−35.3	----	26	375	−25.2	----
9,000	26	320	−37.0	----	28	308	−44.7	----	28	321	−36.6	----	25	307	−43.2	----	26	315	−39.9	----	27	311	−42.2	----	26	325	−32.8	----
10,000	25	276	−44.4	----	28	265	−50.8	----	27	277	−44.2	----	22	265	−48.7	----	26	272	−46.9	----	22	270	−48.3	----	25	282	−39.9	----
11,000	25	237	−51.4	----	25	228	−54.5	----	26	238	−51.0	----	21	228	−53.6	----	22	234	−53.1	----	18	283	−53.6	----	19	244	−47.2	----
12,000	23	203	−57.7	----	22	195	−55.7	----	26	204	−56.7	----	17	194	−56.8	----	19	200	−57.2	----	7	200	−58.9	----	8	209	−54.3	----
13,000	20	173	−61.7	----	17	166	−55.3	----	24	174	−60.6	----	16	165	−56.7	----	16	171	−59.6	----								
14,000	15	147	−62.9	----	13	142	−55.0	----	19	148	−63.0	----	12	141	−57.8	----	10	146	−60.6	----								
15,000	9	125	−63.2	----	8	121	−57.0	----	14	126	−65.3	----	6	120	−55.5	----	7	124	−62.9	----								
16,000	5	106	−66.1	----					8	107	−67.1	----																
17,000									5	90	−68.4	----																

	Medford, Oreg.[2] (409 m.)				Miami, Fla.[2] (4 m.)				Nashville, Tenn. (180 m.)				Norfolk, Va.[1] (4 m.)				Oakland, Calif. (2 m.)				Ogden, Utah (1,355 m.)				Oklahoma City, Okla. (391 m.)			
Surface	30	967	10.5	64	30	1,017	23.1	80	30	994	14.0	65	29	1,016	14.2	65	30	1,017	12.3	73	30	860	7.3	62	30	966	13.4	66
500	30	957	10.1	64	30	961	20.6	80	30	957	13.3	58	29	958	12.0	56	30	958	8.9	73					30	953	13.8	62
1,000	30	901	6.9	66	30	907	17.7	77	30	902	10.4	56	29	902	9.1	55	30	902	7.1	61					30	898	11.0	59
1,500	30	848	3.3	71	30	855	15.1	71	30	849	7.2	58	29	849	6.1	57	30	848	4.7	55	30	845	7.6	55	30	846	9.6	52
2,000	30	796	−0.3	78	30	806	12.3	67	30	799	5.4	46	29	799	3.2	55	30	797	1.9	49	30	795	4.2	56	30	796	7.6	48
2,500	30	748	−3.7	78	30	759	10.2	58	30	751	2.6	43	29	751	0.5	52	30	749	−0.3	38	30	747	0.3	62	30	749	5.0	38
3,000	30	702	−6.8	77	30	714	8.1	49	30	706	−0.2	42	27	705	−2.1	47	30	703	−3.0	36	30	702	−3.8	68	30	704	1.8	37
4,000	30	617	−12.3	61	29	632	3.2	36	30	622	−6.3	36	27	622	−7.5	39	30	619	−9.3	38	30	617	−11.0	70	30	621	−5.7	36
5,000	30	540	−18.4	59	29	558	−2.8	34	30	547	−12.5	41	25	546	−13.8	27	30	543	−15.2	39	30	541	−17.4	57	30	546	−12.4	37
6,000	29	472	−25.2	57	27	491	−9.1	32	30	479	−19.1	43	22	477	−20.4	27	30	475	−21.7	45	30	473	−24.2	51	30	478	−19.3	37
7,000	27	410	−31.9	53	27	431	−16.3	31	30	418	−25.8	----	20	417	−26.6	25	30	414	−28.8	40	30	411	−31.8	50	29	417	−26.9	35
8,000	26	355	−38.8	55	27	376	−23.3	32	30	363	−33.3	----	13	362	−34.7	----	30	359	−36.3	50	30	356	−40.0	----	28	362	−34.1	----
9,000	26	306	−45.6	----	27	327	−30.6	34	30	314	−40.6	----	13	313	−41.8	----	30	310	−43.7	----	30	307	−47.9	----	28	313	−41.0	----
10,000	23	263	−51.4	----	27	284	−37.9	32	30	271	−47.4	----	9	273	−47.9	----	30	267	−49.9	----	29	263	−54.1	----	28	270	−47.9	----
11,000	21	225	−55.3	----	26	244	−43.6	----	27	233	−53.1	----	6	234	−53.9	----	28	229	−55.8	----	29	225	−56.6	----	26	232	−54.2	----
12,000	16	191	−56.5	----	25	210	−52.6	----	26	199	−57.8	----					27	196	−58.5	----	29	192	−55.9	----	25	198	−58.5	----
13,000	14	163	−56.9	----	19	180	−58.3	----	22	170	−60.4	----					25	167	−58.4	----	25	164	−54.9	----	20	168	−59.3	----
14,000	7	140	−55.3	----	11	153	−62.3	----	11	145	−61.8	----					22	143	−58.9	----	24	140	−54.7	----	8	144	−57.1	----
15,000					8	130	−65.7	----	6	124	−62.1	----					17	122	−60.0	----	19	120	−55.4	----	6	122	−58.6	----
16,000																	13	104	−60.6	----	13	102	−57.0	----				
17,000																	9	88	−60.3	----								
18,000																	5	76	−59.7	----								

	Omaha, Nebr. (301 m.)				Phoenix, Ariz. (339 m.)				Pittsburgh, Pa. (392 m.)				Portland, Maine[2] (20 m.)				Rapid City, S. Dak. (981 m.)				St. Louis, Mo. (171 m.)				St. Paul, Minn. (225 m.)			
Surface	27	979	7.8	78	30	970	18.6	36	30	969	8.0	67	29	1012	2.4	80	30	902	5.5	70	30	994	11.1	72	30	990	5.8	68
500	27	956	7.4	75	30	952	19.8	25	30	956	7.8	66	29	954	2.4	72					30	955	9.4	68	30	957	5.6	60
1,000	27	899	4.5	78	30	898	16.4	26	30	900	5.6	65	29	896	−0.1	71	30	899	5.5	70	30	899	6.4	70	30	900	2.3	63
1,500	27	845	1.9	81	30	846	12.2	29	30	847	2.7	65	29	842	−2.7	71	30	846	3.2	66	30	846	4.4	67	30	846	−0.5	64
2,000	27	794	0.6	69	30	797	7.9	34	30	795	0.0	62	29	790	−5.2	71	30	795	0.3	69	30	795	2.2	61	30	794	−2.4	63
2,500	27	746	−1.5	63	30	749	3.6	41	30	747	−2.5	60	29	741	−7.8	71	30	746	−2.7	64	30	747	0.2	49	30	745	−4.0	53
3,000	27	700	−4.2	60	30	704	0.0	43	30	701	−5.2	56	29	695	−10.0	69	30	701	−5.7	61	30	702	−2.5	46	30	699	−6.0	48
4,000	27	616	−9.7	50	30	621	−6.8	40	29	616	−11.0	58	29	610	−14.6	61	30	616	−11.3	55	30	618	−8.4	44	30	615	−11.2	49
5,000	27	541	−15.9	44	30	546	−13.3	41	29	541	−16.9	54	29	534	−20.3	55	30	540	−17.6	52	30	542	−14.6	50	30	539	−17.5	47
6,000	27	473	−22.8	40	30	478	−20.3	41	29	473	−22.9	44	28	466	−26.5	52	30	472	−24.6	44	30	475	−21.6	47	29	471	−23.7	50
7,000	27	412	−30.1	47	30	416	−27.7	----	29	411	−30.1	45	26	404	−33.4	50	30	416	−32.1	51	29	413	−28.9	47	29	410	−31.6	49
8,000	27	357	−37.7	----	30	361	−35.5	----	29	357	−36.7	----	23	351	−39.7	----	29	355	−39.9	51	29	358	−36.5	----	28	355	−39.3	----
9,000	27	308	−45.2	----	29	312	−43.0	----	29	308	−43.7	----	21	302	−46.5	----	28	306	−48.1	----	27	310	−43.1	----	22	306	−47.0	----
10,000	27	265	−51.3	----	28	268	−49.1	----	28	265	−49.6	----	20	259	−51.8	----	27	262	−55.1	----	22	268	−48.6	----	10	263	−52.4	----
11,000	25	227	−55.5	----	26	230	−53.9	----	26	227	−53.4	----	19	222	−53.3	----	23	225	−58.3	----	19	230	−53.5	----	7	226	−53.9	----
12,000	23	194	−57.3	----	26	197	−57.2	----	25	194	−56.3	----	17	190	−53.7	----	18	192	−57.3	----	16	197	−56.6	----	6	195	−57.1	----
13,000	20	166	−56.4	----	24	168	−57.2	----	22	166	−57.9	----	15	162	−53.4	----	13	164	−54.2	----	14	168	−59.1	----	6	167	−56.9	----
14,000	13	142	−55.5	----	23	143	−58.6	----	16	142	−57.6	----	12	139	−53.9	----	10	140	−54.2	----	11	142	−58.8	----				
15,000	7	122	−56.7	----	22	122	−60.6	----	9	122	−58.2	----	6	119	−53.0	----	7	120	−55.5	----	7	122	−59.9	----				
16,000					12	104	−63.5	----	5	104	−58.4	----																

See footnotes at end of table.

TABLE 1.—*Mean free-air barometric pressure in millibars, temperature in degrees centigrade, and relative humidities in percent, obtained by radiosondes during April 1944*—Continued

STATIONS AND ELEVATIONS IN METERS ABOVE SEA LEVEL—Continued

	San Antonio, Tex., (242 m.)				San Diego, Calif. [1] (19 m.)				San Juan, P. R. (15 m.)				Santa Maria, Calif. (71 m.)				S. Ste. Marie, Mich [2] (221 m)				Seattle, Wash. [1] (22 m.)				Spokane, Wash. (598 m.)			
Surface	30	984	19.1	66	25	1012	14.5	76	25	1015	24.6	80	30	1008	10.5	83	30	991	0.8	74	29	1011	12.0	65	30	942	10.1	63
500	30	955	19.3	60	25	957	11.2	74	25	960	20.5	82	30	958	9.2	74	30	958	2.0	68	29	954	8.5	66	----	----	----	----
1,000	30	901	16.7	59	25	901	10.5	54	25	906	16.8	80	30	902	9.1	52	30	900	−0.1	62	29	898	4.6	74	30	898	8.1	55
1,500	30	850	14.4	50	25	849	8.7	42	25	855	14.0	70	30	848	6.3	48	30	845	−2.7	59	28	845	1.6	78	30	845	4.3	57
2,000	30	800	12.2	38	25	798	6.5	43	25	805	11.8	57	30	798	3.4	47	30	793	−5.0	57	27	794	−1.9	81	30	793	0.4	62
2,500	30	754	9.4	36	25	751	4.4	----	25	759	9.3	43	30	750	1.4	33	30	744	−7.4	57	27	745	−5.2	80	30	745	−3.4	65
3,000	30	709	6.6	31	25	706	1.6	----	25	714	6.8	33	30	704	−11.0	27	30	698	−9.7	55	27	699	−8.3	73	30	699	−7.1	67
4,000	30	627	−0.4	26	25	623	−3.9	----	24	632	2.4	----	30	620	−6.4	27	30	612	−14.9	52	27	614	−14.9	63	30	614	−13.8	64
5,000	30	552	−7.7	26	25	548	−9.8	----	23	557	−3.0	----	29	546	−12.4	32	29	536	−21.0	51	27	537	−21.2	63	30	538	−20.1	44
6,000	30	485	−14.6	----	23	481	−17.1	----	22	490	−9.2	----	29	478	−19.1	39	28	467	−27.3	50	26	468	−28.9	62	30	469	−26.9	51
7,000	30	425	−21.9	----	23	420	−24.7	----	21	430	−16.1	----	29	417	−26.6	40	28	406	−34.5	47	26	406	−36.1	65	30	408	−34.2	49
8,000	30	369	−29.4	----	7	366	−31.5	----	21	376	−23.2	----	29	362	−34.3	----	26	351	−41.1	----	23	350	−42.8	----	28	353	−41.5	----
9,000	29	320	−36.7	----	6	316	−39.7	----	21	327	−30.6	----	28	313	−41.9	----	22	304	−47.2	----	23	301	−49.2	----	24	304	−48.7	----
10,000	29	277	−43.9	----	6	274	−47.8	----	21	284	−38.0	----	28	270	−48.9	----	17	261	−52.8	----	23	258	−54.5	----	19	261	−54.6	----
11,000	27	238	−50.9	----	5	235	−55.3	----	19	245	−45.0	----	26	231	−54.5	----	9	222	−53.6	----	23	221	−56.2	----	13	223	−57.5	----
12,000	26	204	−56.5	----	5	200	−59.9	----	15	211	−51.8	----	26	198	−58.4	----	5	187	−50.1	----	22	189	−56.3	----	9	189	−55.5	----
13,000	24	174	−59.8	----	----	----	----	----	9	181	−58.3	----	24	168	−59.6	----	----	----	----	----	21	161	−56.3	----	7	161	−52.1	----
14,000	17	148	−62.0	----	----	----	----	----	----	----	----	----	20	144	−59.5	----	----	----	----	----	16	138	−56.0	----	----	----	----	----
15,000	10	126	−63.4	----	----	----	----	----	----	----	----	----	15	122	−61.0	----	----	----	----	----	15	118	−56.3	----	----	----	----	----
16,000	6	106	−65.1	----	----	----	----	----	----	----	----	----	12	104	−63.2	----	----	----	----	----	13	100	−56.6	----	----	----	----	----

	Swan Island, W. I. (10 m.)				Tacubaya, Mexico (2,306 m.)				Tampa, Fla. (3 m.)				Tapachula, Mexico (115 m.)				Tatoosh Island, Wash. (31 m.)				Toledo, Ohio (19 m.)				Tongue Point, Oreg. [1] [3] (21 m.)			
Surface	29	1013	25.8	79	30	773	19.6	32	30	1018	21.6	81	29	997	26.6	79	30	1010	8.1	82	30	993	5.3	79	----	----	----	----
500	29	958	22.3	80	----	----	----	----	30	961	18.6	73	29	955	25.1	71	30	954	5.7	73	30	956	5.0	70	----	----	----	----
1,000	29	904	19.2	69	----	----	----	----	30	907	16.1	67	29	902	21.4	73	30	897	2.7	72	30	900	3.1	69	----	----	----	----
1,500	29	853	16.6	59	----	----	----	----	30	855	13.0	68	29	852	19.0	78	30	843	− 0.3	70	30	845	0.5	62	----	----	----	----
2,000	29	804	14.6	43	----	----	----	----	30	805	10.7	58	29	803	16.3	79	30	792	− 3.6	70	30	794	− 1.5	60	----	----	----	----
2,500	29	758	13.3	30	30	755	18.4	31	30	758	8.3	45	29	757	13.8	76	30	743	− 6.5	70	30	745	− 4.0	59	----	----	----	----
3,000	29	714	11.6	23	30	712	14.7	34	30	713	6.0	31	29	713	11.2	74	30	697	− 9.4	66	30	700	− 6.6	57	----	----	----	----
4,000	28	632	6.0	18	30	632	5.9	45	30	630	0.7	22	29	632	5.0	66	30	611	−15.8	61	30	614	−12.3	55	----	----	----	----
5,000	28	559	0.4	----	30	558	− 2.0	56	30	556	− 5.7	28	28	559	0.1	29	29	535	−22.6	55	30	538	−18.0	49	----	----	----	----
6,000	27	493	− 5.6	----	30	492	− 9.1	48	30	488	−12.5	30	28	493	− 5.9	----	28	465	−29.3	48	29	471	−24.6	42	----	----	----	----
7,000	27	433	−12.4	----	30	432	−15.3	36	30	428	−19.7	39	28	433	−12.7	----	27	403	−36.9	----	29	409	−32.1	43	----	----	----	----
8,000	27	379	−19.7	----	30	377	−22.4	32	30	373	−26.9	42	28	379	−19.8	----	27	348	−43.7	----	29	354	−39.1	----	----	----	----	----
9,000	26	330	−27.0	----	29	328	−30.0	39	30	323	−34.2	----	27	330	−27.1	----	27	299	−49.5	----	26	306	−45.4	----	----	----	----	----
10,000	25	287	−34.3	----	28	285	−37.8	----	30	280	−41.8	----	27	287	−35.3	----	26	257	−53.9	----	22	265	−50.0	----	----	----	----	----
11,000	25	248	−42.0	----	28	246	−44.9	----	28	242	−49.0	----	27	248	−43.2	----	24	220	−54.2	----	17	228	−54.5	----	----	----	----	----
12,000	22	214	−50.1	----	24	212	−52.0	----	27	207	−55.8	----	27	213	−51.1	----	20	188	−52.8	----	15	195	−57.8	----	----	----	----	----
13,000	20	183	−57.9	----	22	181	−59.3	----	15	177	−60.2	----	26	183	−58.2	----	16	161	−51.6	----	12	167	−58.4	----	----	----	----	----
14,000	16	156	−64.7	----	17	154	−66.0	----	----	----	----	----	21	156	−65.3	----	9	138	−52.5	----	7	141	−55.7	----	----	----	----	----
15,000	14	132	−70.4	----	8	131	−70.0	----	----	----	----	----	13	132	−70.8	----	5	119	−54.4	----	----	----	----	----	----	----	----	----
16,000	13	112	−74.6	----	----	----	----	----	----	----	----	----	7	112	−74.8	----	----	----	----	----	----	----	----	----	----	----	----	----
17,000	12	94	−78.4	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
18,000	10	78	−77.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

Altitude (meters) m. s. l.	Washington, D. C. (25 m.)				Altitude (meters) m. s. l.	Washington, D. C. (25 m.)			Altitude (meters) m. s. l.	Washington, D. C. (25 m.)			Altitude (meters) m. s. l.	Washington, D. C. (25 m.)		
Surface	30	1,014	11.1	64	2,500	30	749	−1.9	59	7,000	30	413	−29.2	44	12,000	21	196	−57.7	----
500	30	958	9.5	58	3,000	30	703	−4.4	55	8,000	30	358	−36.5	----	13,000	15	167	−58.2	----
1,000	30	902	7.1	57	4,000	30	619	−9.7	45	9,000	29	309	−43.4	----	14,000	7	142	−58.1	----
1,500	30	848	3.9	61	5,000	30	543	−15.9	41	10,000	28	266	−49.7	----					
2,000	30	797	0.8	63	6,000	30	475	−22.7	44	11,000	24	229	−55.6	----					

[1] U. S. Navy.
[2] Humidity data obtained by hair hygrometer, others using electric hygrometer.
[3] Insufficient observations.

NOTE.—All observations taken near 11:00 p. m. E. S. T., except at Mexican stations, where they are taken near 9:00 p. m.

"Number of Observations" refers to pressure only, as temperature and humidity data are sometimes missing for some observations at certain levels. Relative humidity data are not used in daily observations when the temperature is below −40.0° C.

None of the means included in these tables are based on less than 15 surface or 5 standard level observations.

Means for observations obtained by the electric hygrometer have been adjusted to compensate for the values occurring below the operating range of the humidity element.

TABLE 2.—*Free-air resultant winds based on pilot-balloon observations made near 5 p. m. (75th meridian time) during April 1944. Directions given in degrees from North (N=360°, E=90°, S=180°, W=270°). Velocities in meters per second*

Altitude (meters) m. s. l.	Abilene, Tex. (538 m.)			Albuquerque, N. Mex. (1,630 m.)			Atlanta, Ga. (290 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (512 m.)			Boise, Idaho (870 m.)			Brownsville, Tex. (7 m.)			Buffalo, N. Y. (220 m.)			Burlington, Vt. (132 m.)			Charleston, S. C. (17 m.)			Cincinnati, Ohio (152 m.)			Denver, Colo. (1,627 m.)			El Paso, Tex. (1,196 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	30	225	2.6	30	256	3.8	28	246	3.0	30	49	2.0	29	111	3.7	30	319	2.0	30	109	5.6	26	327	1.9	26	308	2.3	30	241	1.4	30	255	1.2	29	75	1.8	30	248	6.6
500							28	252	3.3										30	116	5.6	26	296	2.2	26	293	2.8	30	230	4.2	30	240	2.0						
1,000	30	222	4.0				27	251	3.7				29	114	3.7	30	324	2.4	24	116	2.3	29	307	3.6	25	277	4.0	25	249	4.8	28	239	3.4						
1,500	30	229	4.1				27	255	4.8	30	77	1.4	29	118	3.2	30	296	1.8	19	338	2.0	17	289	6.3	22	285	5.7	23	279	6.4	26	237	6.1				30	248	6.3
2,000	30	228	7.2	30	242	4.3	26	249	6.6	29	28	1.2	24	109	1.9	28	264	2.1	16	295	3.5	14	295	6.8	18	296	7.9	23	297	8.0	18	253	6.8	29	60	1.7	30	256	6.6
2,500	28	233	9.1	29	253	5.6	25	261	8.9	29	67	0.9	22	84	1.3	24	253	2.2	15	266	5.3	12	291	7.4	15	312	11.0	23	306	9.6	11	262	5.1	25	120	1.3	29	254	7.6
3,000	26	241	11.0	27	264	5.7	22	259	11.4	25	6	0.8	18	13	2.1	24	248	2.9	14	263	7.2	10	304	7.8	10	306	11.7	20	298	11.9	10	268	6.8	22	238	2.2	29	257	9.3
4,000	23	251	16.2	19	267	9.4	20	272	14.2	17	267	3.1	15	3	1.4	22	230	2.2	14	258	10.1							15	303	12.5				16	262	5.7	25	254	13.0
5,000	17	257	19.0	11	274	13.8	15	275	17.3	13	291	3.6	14	337	3.6	15	233	4.6	11	258	13.3							14	296	14.1				15	272	7.2	22	261	15.3
6,000	13	262	21.2				13	283	20.7	10	294	4.3	13	329	6.5	13	258	6.9										14	301	15.5				11	284	9.0	19	254	16.9
8,000													12	327	8.3																							

Altitude (meters) m. s. l.	Ely, Nev. (1,910 m.)			Grand Junction, Colo. (1,413 m.)			Greensboro, N. C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Joliet, Ill. (178 m.)			Las Vegas, Nev. (573 m.)			Little Rock, Ark. (88 m.)			Medford, Oreg. (410 m.)			Miami, Fla. (12 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (194 m.)			New York, N. Y. (15 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	29	212	0.9	30	258	1.0	28	255	2.8	29	123	1.2	28	93	2.5	26	91	1.0	30	259	1.9	29	168	2.7	29	324	1.4	30	121	3.9	27	185	1.3	30	223	2.1	27	294	1.7
500							28	253	4.6				28	143	1.4	26	76	1.3				29	178	4.1	29	318	1.5	29	122	4.0	27	184	2.4	30	214	3.6	27	283	3.6
1,000							28	250	6.1	29	126	2.2	26	229	2.6	23	179	0.9	30	244	2.5	26	193	5.1	29	274	1.8	28	147	1.5	20	228	2.5	29	224	4.7	24	287	5.2
1,500				30	253	1.3	28	249	6.5	28	145	1.7	24	254	5.2	20	223	2.3	30	236	2.4	25	216	6.2	26	223	2.9	25	256	1.6	19	257	4.3	26	241	6.2	23	283	7.1
2,000	29	215	1.6	30	253	2.0	26	264	7.8	28	190	2.1	24	268	7.1	15	221	4.2	30	239	2.8	19	244	5.6	24	214	3.8	21	248	2.7	18	269	6.6	23	257	7.4	16	289	9.3
2,500	29	239	2.0	29	241	2.5	25	279	9.5	25	202	1.8	22	273	8.0	13	259	4.4	30	259	3.4	17	273	7.9	22	217	4.3	18	249	3.8	13	278	9.0	19	256	10.4	12	300	10.3
3,000	27	252	2.2	26	247	3.4	21	282	13.0	20	191	2.1	21	271	9.1	10	298	5.5	26	247	4.4	17	275	9.4	19	225	4.5	15	252	5.5	12	275	10.4	17	262	13.0			
4,000	15	252	4.2	21	259	3.8	20	275	16.6	16	227	1.9	17	275	9.3				24	273	7.6	11	291	12.9	10	265	5.3	13	262	8.1							14	275	11.9			
5,000	11	272	7.4	12	296	4.9	14	278	16.4	11	240	2.6	13	279	13.6				20	276	9.8							11	260	8.3							14	277	15.5			
6,000				10	289	6.2	10	270	14.4				13	276	16.7				17	280	14.5							10	266	8.6							12	287	17.7			
8,000																			14	286	21.1																			

Altitude (meters) m. s. l.	Oakland, Calif. (8 m.)			Oklahoma City, Okla. (396 m.)			Omaha, Nebr. (306 m.)			Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)			St. Louis, Mo. (181 m.)			St. Paul, Minn. (225 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (15 m.)			Sault Ste. Marie, Mich. (230 m.)			Seattle, Wash. (12 m.)			Spokane, Wash. (603 m.)			Washington, D. C. (24 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	30	257	6.2	30	201	1.6	27	22	1.5	30	258	2.0	29	94	1.6	28	263	0.9	28	44	1.1	29	131	1.6	30	261	3.7	27	313	3.1	27	251	3.0	30	221	2.0	25	295	2.6
500	30	270	4.7	30	180	1.6	27	12	1.8	30	256	3.5				28	255	2.1	28	50	2.4	29	147	1.5	30	263	3.3	27	327	3.5	27	218	3.3				25	292	3.9
1,000	26	287	3.4	30	211	2.6	24	22	0.9	30	251	3.8	29	91	1.6	26	234	3.7	24	50	2.1	28	167	3.0	22	271	1.8	24	331	3.2	26	200	4.0	30	224	2.9	23	283	5.0
1,500	25	290	3.4	28	228	4.4	20	212	2.3	30	239	3.8	29	104	1.7	23	243	4.1	21	26	2.0	23	188	3.1	22	279	2.5	24	327	3.3	22	201	6.0	25	211	3.0	22	269	6.1
2,000	23	285	3.0	23	233	5.9	12	251	4.8	29	237	4.4	26	207	0.9	19	238	6.3	21	341	1.9	22	220	4.8	22	283	3.9	24	325	4.4	18	195	5.4	23	208	2.8	16	272	7.2
2,500	21	289	4.0	22	241	8.1				29	255	5.1	23	298	1.5	15	256	10.7	17	328	4.3	20	243	7.4	21	293	4.6	23	329	4.8	15	199	5.1	22	207	3.8	14	280	9.3
3,000	19	308	6.4	21	249	10.4				27	274	6.1	17	312	4.2	13	246	10.3	17	326	6.1	18	254	10.8	21	300	5.5	23	310	7.4	11	221	3.0	19	200	3.5	12	290	12.1
4,000	18	302	8.7	16	258	14.8				27	270	10.5	15	284	4.4				17	329	7.1	15	253	11.0	19	298	9.7	22	311	10.1	10	238	6.7	15	229	3.6			
5,000	17	290	10.2	13	270	17.1				23	266	11.5	12	314	4.5				14	325	8.0	15	252	16.6	13	279	13.2	18	305	13.1									
6,000	16	296	15.9	12	272	20.7				21	270	15.7	11	307	6.3				10	324	8.0	12	181	20.4				13	310	14.9									
8,000	12	306	18.8										10	298	8.3													11	302	16.5									

TABLE 3.—*Maximum free-air wind velocities (m. p. s.), for different sections of the United States based on pilot-balloon observations during April 1944*

Section	Surface to 2,500 meters (m. s. l.)					Above 2,500 and 5,000 meters (m. s. l.)					Above 5,000 meters (m. s. l.)				
	Maximum velocity	Direction	Altitude (m) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m) m. s. l.	Date	Station
Northeast [1]	44.6	WNW	2,265	14	Boston, Mass.	49.2	WNW	2,880	14	Albany, N. Y.	90.0	NW	10,903	23	Caribou, Maine.
East-Central [2]	36.4	SW	2,042	23	Cincinnati, Ohio	48.8	WSW	2,804	15	Nashville, Tenn.	62.5	W	10,759	1	Nashville, Tenn.
Southeast [3]	36.2	NW	2,268	5	Birmingham, Ala.	43.8	W	4,945	15	Birmingham, Ala.	58.0	W	10,864	1	Atlanta, Ga.
North-Central [4]	42.2	E	810	11	Muskegon, Mich.	39.9	NW	5,000	13	S. Ste. Marie, Mich.	64.0	NNW	8,052	12	Marquette, Mich.
Central [5]	44.2	SSW	1,412	6	Dodge City, Kans.	44.0	NW	4,310	4	Dodge City, Kans.	48.0	W	5,829	4	Sioux City, Iowa.
South-Central [6]	42.4	W	2,020	10	Del Rio, Tex.	43.0	WSW	3,172	20	Amarillo, Tex.	62.8	W	11,486	12	Big Spring, Tex.
Northwest [7]	33.6	WNW	1,701	30	Ellensburg, Wash.	33.3	NNW	3,260	1	Glasgow, Mont.	50.0	SW	12,557	4	Havre, Mont.
West-Central [8]	54.6	S	2,214	8	Grand Junction, Col.	47.8	NW	5,000	16	Redding, Calif.	59.0	WSW	9,825	5	Ely, Nev.
Southwest [9]	45.1	W	2,483	10	El Paso, Tex.	44.8	W	2,501	10	El Paso, Tex.	73.0	W	10,635	17	Albuquerque, N. Mex.

[1] Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, and northern Ohio.
[2] Delaware, Maryland, Virginia, West Virginia, southern Ohio, Kentucky, eastern Tennessee, and North Carolina.
[3] South Carolina, Georgia, Florida, and Alabama.
[4] Michigan, Wisconsin, Minnesota, North Dakota, and South Dakota.
[5] Indiana, Illinois, Iowa, Nebraska, Kansas, and Missouri.
[6] Mississippi, Arkansas, Louisiana, Oklahoma, Texas (except El Paso), and western Tennessee.
[7] Montana, Idaho, Washington, and Oregon.
[8] Wyoming, Colorado, Utah, northern Nevada, and northern California.
[9] Southern California, southern Nevada, Arizona, New Mexico, and extreme west Texas.

RIVER STAGES AND FLOODS

By BENNETT SWENSON

PRECIPITATION during April was above normal over a large area of the country, main exceptions being portions of Montana, the Dakotas, Minnesota, Florida, and a strip from southern Texas westward. Streamflow for the month was above normal in most areas east of the Rocky Mountains except in portions of Texas, western Oklahoma, and in the Northeast. Precipitation was abundant in the Rocky Mountain area but temperatures were low and much of the precipitation fell in the form of snow at the higher elevations, delaying run-off. Excessive rains occurred in the middle Arkansas, lower Missouri, middle Mississippi, and lower Ohio River valleys, and in the Southeastern States, producing excessive flooding in those areas. In portions of the Arkansas and Missouri Basins floods approached and in some cases exceeded those of May 1943 and the flood stage in the Mississippi River at St. Louis reached the highest point since 1844.

St. Lawrence Drainage.—Frequent rains in the early part of the month followed by excessive rains of 2½ to 3 inches on April 9–12 over the Maumee River Basin resulted in considerable flooding. A crest of 20.8 was reached at Fort Wayne, Ind., on the 12th, only 1.4 feet lower than the flood of May 1943.

Atlantic Slope Drainage.—Cool weather during most of the month in New England resulted in a rather evenly distributed spring run-off from the areas of heavy snow. Flood stage occurred only at Hartford, Conn., on the Connecticut River, where two rises were recorded—the first rise reached a crest of 16.4 feet on the 13th and the second rise crested at 18.6 on the 26th. The rises were produced by periods of moderate rainfall from the 12th to 14th and from the 23d to 24th associated with run-off from melting snow. These periods of moderate rainfall also produced minor rises in the Chenango and upper Susquehanna Rivers.

Flooding, mostly light, occurred in rivers in the Carolinas and Georgia, while the overflows in the Altamaha River in Georgia were moderate.

East Gulf of Mexico Drainage.—High water and excessive floods persisted through most of April, continuing in most cases from the previous month. The Tombigbee River at Demopolis, Ala., remained above flood stage continuously from March 22 to May 12; the Pearl River at Jackson, Miss., and the Apalachicola River at Blountstown, Fla., remained above flood stage from March 20 to May 17. However, previous long-term record stages were not exceeded during April.

MISSISSIPPI SYSTEM

The extensive and destructive flooding in the middle Arkansas, lower Missouri, middle Mississippi, and lower Ohio River basins occurred less than a year after the extraordinary floods of May 1943 in much the same region. The greatest floods of record occurred in the Cottonwood River at Cottonwood Falls, Kans., and in portions of the upper Neosho River below Neosho Rapids, Kans. The highest stages since 1903 occurred in the lower Missouri.

Upper Mississippi River.—No flooding occurred in the Mississippi River above Keokuk, Iowa, during April. The potential moisture from snow cover in the upper reaches was far below normal and there were no marked maximum peaks even in the smaller tributaries. However, light to moderate overflows occurred in the lower Rock, Skunk, Des Moines, and Fox Rivers later in the month from heavy rains. Two rises occurred in the Salt, Illinois, and Meramec Rivers. The first rise was produced by heavy rains on April 9–11, whereas excessive rains on April 21–23, while the streams were still high, produced a second and greater rise. These overflows were moderately severe but were below record stages. The flood stages in the Illinois River were several feet below the flood of May 1943.

Missouri River Basin.—The tributary streams in the upper Missouri River Basin began to break up during the latter part of March. Considerable water was discharged into the Missouri River by the Yellowstone River. Floods occurred on most of the rivers in western North Dakota during April. The greatest damage in North Dakota occurred in the Heart River, where flooding began on April 1 when ice jammed about 15 miles west of Mandan, N. Dak. Jams forming later near the mouth of the river caused overflows of lowlands near Mandan. High water occurred also in the Knife, Cannonball, and Little Missouri Rivers.

High stages resulted in the Missouri River from Bismarck, N. Dak., downstream but flood stages were not exceeded until the crest reached Mobridge, S. Dak., on April 5. The crest of the flood reached Nebraska City, Nebr., on April 17–18, with a reading of 19.6 feet, resulting in considerable overflow in that area. On April 20, when the crest reached St. Joseph, Mo., heavy rains fell over the Kansas River Basin, causing the Kansas River to rise rapidly, flooding from Ogden, Kans., to the mouth. Owing to this inflow from the Kansas River the crest in the Missouri which passed St. Joseph lost its identity as it reached Kansas City. At that point the river continued to rise until April 24, when the crest stage was 27.6 feet.

Torrential rains on April 22 in the immediate Kansas City area produced a critical flood in the Blue River near Kansas City causing considerable damage. A crest stage of 35.9 feet on April 23 was recorded, exceeding the flood of 1935 but below the record stage of about 39 feet established in November 1928.

The extreme upper Osage River was in severe flood, with a crest stage of 38.1 feet at Quenemo, Kans., on April 23, only 0.3 foot below the crest of the 1928 flood. Flooding in the lower Osage in Missouri was not particularly severe. The Grand River in Missouri was also in severe flood with a crest stage at Chillicothe, Mo., only 0.8 foot below the record stage of 32.1 feet in 1929.

The crest in the Missouri River that passed Waverly, Mo., was augmented by the large flow from the Grand River and other tributaries and the stage at Boonville, Mo., equalled that of the 1903 flood at 30.9 feet. At Hermann and St. Charles, Mo., the crest stages were 0.5 and 0.1 foot, respectively, lower than the May 1943 flood.

The near record flow in the Missouri River and in the Mississippi River below the mouth of the Illinois River resulted in a stage of 39.1 feet at St. Louis, Mo., 0.2 foot above the May 1943 flood and exceeded only by the flood of 1844 when a stage of 41.4 feet was recorded.

Ohio River Basin.—Light to moderate overflows occurred in the Scioto and Green Rivers and severe, but not record-breaking floods prevailed in the Wabash River Basin during the month. Flood stages were also reached in portions of the Cumberland River and in the lower Tennessee River.

A moderate rise in the Ohio River reached Tell City, Ind., with above flood stages prevailing to the mouth. No

flooding occurred above Tell City. Below the mouth of the Wabash the flood was of moderate proportions. The crest at Cairo, Ill., was 51.2 feet on April 29, compared to 53.0 feet in May 1943. The lower stage this year was due largely to the fact that the Ohio River crest passed ahead of the main Mississippi River crest.

White and Arkansas Basins.—Floods in the White River were mostly light and little damage occurred.

Severe floods resulted in the middle Arkansas River Basin from widespread heavy rain during two separate rainfall periods. The first flood was confined mostly to the Neosho and Walnut Rivers in Kansas and the Verdigris River in Kansas and Oklahoma. The second flood period from April 22–29 was the most severe.

Widespread general rains of 1 to nearly 2 inches were reported on the 9th in south-central and southeastern Kansas, followed by rainfall amounts of 1 to 2½ inches over the same area on the 10th. There were locally heavy amounts of 3 to more than 5 inches extending from central Oklahoma northeastward through Perry and Ralston, Okla., to Sedan and Chanute, Kans., and from 2 to 4 inches in the Verdigris, Walnut, Little Arkansas, and Ninnescah River Basins in Kansas. Unofficial reports indicate that as much as 7 inches occurred in portions of the Little Arkansas and lower Ninnescah River Basins.

During the period April 9–11 floods developed in the lower Cottonwood, Neosho, Verdigris, Walnut, Little Arkansas, and Arkansas Rivers in Kansas. These crests moved downstream into Oklahoma causing above flood stage on the Arkansas River to Van Buren, Ark.

The second period of rainfall, following within 9 days of the first period with streams still high, caused severe floods in the Arkansas River from Wichita, Kans., to below Tulsa, Okla., and in most streams in south-central and southeastern Kansas, spreading into Oklahoma. The flood was the greatest of record in the Neosho River in Kansas below Neosho Rapids and in the Cottonwood River. Record or near record stages occurred in the Arkansas River at Ralston, Okla., and Wichita, Kans., and the Little Arkansas River at Sedgwick, Kans. While the Walnut River proper did not reach record stage, the City of Winfield, Kans., suffered probably the worst flood of history caused by Timber and Dutch Creeks and breaks in the levee. Flood damages in the Wichita and Winfield areas will run into the millions and approximately 5,000 people were homeless for several days. Much livestock was lost and five persons were drowned.

Red and Lower Mississippi River Basins.—Moderately severe flooding occurred in the Ouachita River in Arkansas and in the Yazoo River in Mississippi. The Yazoo at Greenwood, Miss., crested at 38.4 feet, 1.7 feet below the 1932 flood.

The Mississippi River exceeded flood stage at New Madrid, Mo., on March 31, and by April 29 flood stages prevailed along most of the river as far south as Donaldsonville, La. Stages continued to rise at the close of the month except at New Madrid where the crest occurred on the 30th.

Further report on the floods in the Mississippi System will be made at a later date.

FLOOD-STAGE REPORT FOR APRIL 1944

[All dates in April unless otherwise specified]

River and station	Flood stage	Above flood stages—dates		Crest [1]	
		From—	To—	Stage	Date
ST. LAWRENCE DRAINAGE					
Lake Erie	*Feet*			*Feet*	
St. Marys: Decatur, Ind.	13	10	17	20.2	12
		24	24	13.4	24
St. Joseph:					
Montpelier, Ohio	10	11	17	11.5	13
		25	25	10.2	25
Fort Wayne, Ind.	12	10	17	17.2	13
		23	25	12.4	24
Maumee:					
Fort Wayne, Ind.	15	11	18	20.8	12
		24	25	15.9	24
Defiance, Ohio	10	11	16	14.8	13
Napoleon, Ohio	10	11	15	13.9	13
Sandusky: Upper Sandusky, Ohio	13	12	12	13.1	12
ATLANTIC SLOPE DRAINAGE					
Connecticut: Hartford, Conn.	16	13	14	16.4	13
		25	29	18.6	26
Perkiomen Creek: Gratersford, Pa.	8	24	25	11.7	24
Chenango: Sherburne, N. Y.	8	10	11	8.5	10
		13	13	8.0	13
Susquehanna:					
Oneonta, N. Y.	12	10	14	12.6	11
				12.7	13
		24	27	13.2	25
Vestal, N. Y.	14	11	11	14.1	11
Roanoke:					
Weldon, N. C.	31	Mar. 31	2	35.5	1
		13	15	34.7	14
Williamston, N. C.	10	Feb. 20	(2)	11.3	Feb. 27, Mar. 20, Apr. 6
				11.2	20
Tar:					
Tarboro, N. C.	18	17	17	18.2	17
Greenville, N. C.	13	17	20	13.9	18
Neuse:					
Neuse, N. C.	14	12	17	16.7	15
Smithfield, N. C.	13	Mar. 31	2	14.0	2
		12	19	18.0	16
Goldsboro, N. C.	14	Mar. 10	1	20.9	Mar. 27
		14	23	17.8	20
Kinston, N. C.	14	Mar. 13	4	15.2	Mar. 16
				17.8	Mar. 30
		17	26	15.9	22
Haw: Moncure, N. C.	20	12	13	21.8	12
Cape Fear:					
Fayetteville, N. C.	35	13	15	38.5	13
Lock No. 2, Elizabethtown, N. C.	20	Mar. 31	3	24.2	1
		12	19	29.8	15
Ogeechee: Dover, Ga.	7	Mar. 21	11	12.4	Mar. 28
		16	16	7.1	16
		20	(2)	7.8	26
Ocmulgee:					
Macon, Ga.	18	27	29	19.0	28
Hawkinsville, Ga.	25	2	3	25.6	2
Abbeville, Ga.	11	15	(2)	13.3	17
				14.0	29
Lumber City, Ga.	15	----------	----------	20.6	Mar. 30
				15.8	22
				16.5	29–30
Oconee: Dublin, Ga.	21	2	4	21.4	3–4
Altamaha:					
Charlotte, Ga.	12	Feb. 25	(2)	24.8	Mar. 31
Piney Bluff, Ga.	17	Mar. 24	14	26.0	1
		17	(2)	19.1	21–22
EAST GULF OF MEXICO DRAINAGE					
Chattahoochee:					
Columbus, Ga.	34	----------	----------	34.6	28
Eufaula, Ala.	40	27	30	48.9	29
Columbia, Ala.	42	28	30	45.5	29
Flint:					
Montezuma, Ga.	20	Mar. 31	2	21.2	1
Albany, Ga.	20	16	22	26.5	17
		27	May 3	26.9	29
Bainbridge, Ga.	25	18	26	28.9	22–23
		29	May 6	29.5	May 2
Apalachicola:					
Chattahoochee, Fla.	20	20	May 4	21.5	22
				24.8	May 2
Blountstown, Fla.	15	Mar. 20	May 17	23.1	Mar. 29
				23.6	3
				21.8	23–25
				29.5	May 2

See footnotes at end of table.

FLOOD-STAGE REPORT FOR APRIL 1944—Continued

River and station	Flood stage	Above flood stages—dates		Crest [1]	
		From—	To—	Stage	Date
EAST GULF OF MEXICO DRAINAGE—con.					
Choctawhatchee:	*Feet*			*Feet*	
Newton, Ala.	19	16	17	23.0	17
Geneva, Ala.	23	23	24	23.3	23
Caryville, Fla.	12	18	(2)	13.3	21, 25
Conecuh:					
River Falls, Ala.	35	28	(2)	39.0	29
Brewton, Ala.	17	27	28	17.0	27–28
		30	(2)		
Oostanaula:					
Resaca, Ga.	22	Feb. 28	Mar. 2	24.7	Mar. 1
		Mar. 21	Mar. 22	22.3	Mar. 22
		Mar. 29	(2)	28.7	Mar. 31
Rome, Ga.	25	Feb. 28	Feb. 29	26.3	Feb. 28
		Mar. 21	Mar. 21	25.2	Mar. 21
		Mar. 29	(2)	29.0	Mar. 30–31.
Etowah:					
Canton, Ga.	17	Mar. 20	Mar. 20	19.1	Mar. 20
		Mar. 30	Mar. 30	17.0	Mar. 30
		Feb. 27	Feb. 28	21.8	Feb. 28
Cartersville, Ga.	18	Mar. 7	Mar. 7	18.1	Mar. 7
		Mar. 20	Mar. 21	22.4	Mar. 20
		Mar. 29	Mar. 31	22.65	Mar. 30
Coosa:					
Mayos Bar Lock, Ga.	28	Feb. 28	Mar. 1	29.9	Feb. 29
		Mar. 21	Mar. 22	28.5	Mar. 21
		Mar. 29	(2)		
Gadsden, Ala.	20	Feb. 19	Feb. 23	20.9	Feb. 21
		Feb. 28	Mar. 5	22.7	Feb. 29
		Mar. 7	Mar. 10	21.2	Mar. 9
		Mar. 22	Mar. 26	21.1	Mar. 24
		Mar. 28	4	25.2	Mar. 31
Lock No. 4, Lincoln, Ala.	17	Mar. 28	(2)		
Childersburg, Ala.	20	Mar. 29	(2)	22.3	Mar. 30
Wetumpka, Ala.	45	Mar. 31	Mar. 31	45.1	Mar. 31
Tallapoosa: Milstead, Ala.	40			46.1	27
Black Warrior:					
Lock No. 10, Tuscaloosa, Ala.	47	Mar. 28	2	62.0	Mar. 30
Lock No. 7, Eutaw, Ala.	35	Mar. 22	Mar. 25	36.6	Mar. 24
		Mar. 28	10	53.2	2
		12	18	42.2	15
		25	(2)		
Tombigbee:					
Aberdeen, Miss.	34	Mar. 28	4	43.0	Mar. 30
Columbus, Miss.	29	Mar. 29	5	37.6	1
Gainesville, Ala.	36	Mar. 29	16	50.6	5
Lock No. 4, Demopolis, Ala.	39	Mar. 22	May 12	61.2	7
				52.9	29
Lock No. 3, Ala.	33	Mar. 21	(2)	59.3	8–9
				56.1	28
Lock No. 2, Ala.	46	Mar. 23	(2)	60.7	9
				58.4	28
Lock No. 1, Ala.	31	Mar. 23	May 16	41.5	12
				41.8	28
Chickasawhay:					
Enterprise, Miss.	20	Mar. 30	1	23.7	Mar. 31
		20	21	21.7	21
		25	30	26.3	28
Shubuta, Miss.	30	3	3	30.2	3
		23	(2)		
Waynesboro, Miss.	35	26	(2)	38.2	27
Pascagoula: Merrill, Miss.	22	Mar. 24	6	24.4	1–2
		27	May 8		
Pearl:					
Edinburg, Miss.	20	Mar. 28	4	25.9	Mar. 31
		27	May 1	22.1	29
Jackson, Miss.	18	Mar. 20	May 17	34.0	4
Monticello, Miss.	15	Mar. 22	17	23.6	8
		21	May 12	19.7	29
Columbia, Miss.	17	Mar. 24	18	18.6	Mar. 25
				22.8	10
		24	May 12	19.6	28
Pearl River, La.	12	Mar. 9	(2)	12.9	Mar. 15
				15.9	2–3
MISSISSIPPI SYSTEM					
Upper Mississippi Basin					
Rock: Moline, Ill.	10	24	29	10.3	27
Skunk: Augusta, Iowa.	15	22	27	19.6	24
Des Moines:					
Tracy, Iowa.	14	22	25	16.0	24
Eddyville, Iowa.	15	21	28	19.2	24
Ottumwa, Iowa.	9	22	26	11.3	24
Fox: Wayland, Mo.	15	23	25	18.5	24
Salt: New London, Mo.	19	11	14	26.2	13
		23	27	26.5	25
Illinois:					
Morris, Ill.	13	11	17	17.8	12
		23	27	18.3	24
Peru, Ill.	17	12	May 8	20.2	13
				23.2	25
Peoria, Ill.	18	15	(2)	20.0	16
				23.6	27
Havana, Ill.	14	Mar. 19	6	15.6	Mar. 20–21
		11	(2)	23.3	29
Beardstown, Ill.	14	Mar. 20	5	15.0	Mar. 21–24
		11	(2)	26.2	29–30

FLOOD-STAGE REPORT FOR APRIL 1944—Continued

River and station	Flood stage	Above flood stages—dates		Crest [1]	
		From—	To—	Stage	Date
MISSISSIPPI SYSTEM—continued					
Upper Mississippi Basin—Continued					
Bourbeuse: Union, Mo.	*Feet* 12	24	24	*Feet* 12.3	24
Meramec:					
Pacific, Mo.	11	12	14	12.7	14
		23	25	13.4	25
		13	13	14.4	13
Valley Park, Mo.	14	23	26	18.2	25
		28	(2)	15.1	29
Mississippi:					
Keokuk, Iowa.	12	23	29	15.1	24–25
Gregory Landing, Mo.	12	23	29	15.3	25
Quincy, Ill.	14	22	30	19.1	25
Hannibal, Mo.	13	11	14	14.3	12
		16	18	13.3	17
		21	(2)	19.6	25
Louisiana, Mo.	12	10	15	14.5	13
		17	17	12.0	17
		21	May 14	19.2	26
				13.2	May 6
Grafton, Ill.	18	12	20	20.4	15
		22	(2)	28.6	30
St. Louis, Mo.	30	14	18	31.2	16
		23	May 13	39.1	30
Chester, Ill.	27	14	May 16	29.7	17–18
				37.3	May 2–3
Cape Girardeau, Mo.	32	14	2	34.8	18
				40.8	May 6
Missouri Basin					
Solomon: Beloit, Kans.	18	24	26	20.85	25
Smoky Hill:					
Lindsborg, Kans.	21	23	24	22.4	23
Enterprise, Kans.	26	23	24	26.6	23–24
		26	27	26.4	27
Kansas:					
Ogden, Kans.	18	23	23	18.25	23
Manhattan, Kans.	17	22	27	20.7	23
				17.8	26–27
Wamego, Kans.	16	23	24	17.0	23
Topeka, Kans.	21	22	24	25.4	23
		26	27	22.0	26
LeCompton, Kans.	17	22	25	22.0	24
Lawrence, Kans.	18	22	25	23.3	23
		27	27	19.4	27
Delaware: Valley Falls, Kans.	22	22	24	25.1	23
Thompson Fork: Trenton, Mo.	20	22	23	20.9	23
Grand:					
Gallatin, Mo.	20	21	26	31.5	24
Chillicothe, Mo.	18	11	13	24.4	11
		15	17	22.4	15
		21	29	31.3	23
Brunswick, Mo.	12	11	May 11	23.8	26
Osage:					
Quenemo, Kans.	30	11	12	35.2	11
		23	24	38.1	23
Ottawa, Kans.	24	10	13	30.7	12
		22	26	36.5	23
La Cygne, Kans.	25	11	16	29.4	14
		22	30	31.9	24
Trading Post, Kans.	24	12	17	26.7	15
		23	May 2	30.8	25
Osceola, Mo.	20	11	18	22.4	13
				21.8	16
		27	(2)	31.6	May 1
Lakeside, Mo.	60	28	May 8	61.4	May 3
St. Thomas, Mo.	23	13	15	23.5	14
		24	May 8	25.9	29
				29.0	May 4
Missouri:					
Mobridge, S. Dak.	16	5	5	16.6	5
Pierre, S. Dak.	15	8	10	15.6	9
Blair, Nebr.	18	10	18	21.0	13
Omaha, Nebr.	19	14	17	19.4	16
Nebraska City, Nebr.	15	10	21	19.6	17–18
St. Joseph, Mo.	17	16	22	18.5	20
Kansas City, Mo.	22	21	28	27.6	24–25
Lexington, Mo.	22	12	13	22.3	12
		20	29	27.7	24
Waverly, Mo.	18	11	30	19.6	13
				24.3	24
Boonville, Mo.	21	12	May 10	22.9	14
				30.9	27
Hermann, Mo.	21	11	May 12	24.2	15
				30.6	28
St. Charles, Mo.	25	11	May 13	29.9	16
				36.5	29
Ohio Basin					
Scioto:					
La Rue, Ohio.	11	11	12	13.65	12
Prospect, Ohio.	10	12	14	11.7	13
Circleville, Ohio.	14	12	14	17.1	13
Chillicothe, Ohio.	16	13	14	16.6	14
Piketon, Ohio.	16	12	15	18.5	14
Green:					
Munfordville, Ky.	28	13	14	28.4	14
Lock No. 4, Woodbury, Ky.	33	Mar. 21	Mar. 23	34.3	Mar. 22
		12	16	36.4	14
Lock No. 2, Rumsey, Ky.	34	15	20	36.3	18

See footnotes at end of table.

FLOOD-STAGE REPORT FOR APRIL 1944—Continued

River and station	Flood stage	Above flood stages—dates		Crest [1]	
		From—	To—	Stage	Date
MISSISSIPPI SYSTEM—continued					
Ohio Basin—Continued					
	Feet			*Feet*	
West Fork:					
Anderson, Ind.	10	10	14	17.4	12
		24	24	10.1	24
Noblesville, Ind.	14	11	14	17.6	13
Elliston, Ind.	18	10	19	27.7	14
		23	29	24.4	26–27
Edwardsport, Ind.	12	10	May 3	24.0	15
				20.8	28
East Fork:					
Seymour, Ind.	14	10	15	18.2	12
Williams, Ind.	10	13	19	17.0	15
Shoals, Ind.	25	15	19	27.8	17
White:					
Petersburg, Ind.	16	12	May 2	23.8	15–17
				21.4	29
Hazleton, Ind.	16	12	May 3	25.9	18
				22.2	29
Wabash:					
Bluffton, Ind.	10	11	15	13.8	13
Wabash, Ind.	12	10	17	20.8	11
		23	26	17.2	23
La Fayette, Ind.	11	10	20	22.8	13
		23	29	19.1	25
Covington, Ind.	16	11	21	26.3	14
		23	30	22.4	27
Terre Haute, Ind.	14	11	May 2	21.6	16
				19.0	26
Riverton, Ind.	------	------	------	21.7	19
				19.8	29
				20.5	20
Vincennes, Ind.	14	14	May 5	19.3	24
				18.7	29
Mt. Carmel, Ill.	17	13	May 5	24.2	20
				22.5	30
New Harmony, Ind.	15	16	May 6	19.7	20
				17.8	May 2
Cumberland:					
Celina, Tenn.	28	13	16	32.1	15
Lock F, Eddyville, Ky.	50	1	6	51.9	4
Duck: Columbia, Tenn.	32	Mar. 29	Mar. 31	34.7	Mar. 30
		12	12	33.7	12
Tennessee:					
Bridgeport, Ala.	18	Mar. 28	[2]	22.3	Mar. 30
Johnsonville, Tenn.	31	Mar. 31	7	36.5	4
Ohio:					
Tell City, Ind.	38	16	20	40.0	18
Dam No. 47, Newburgh, Ind.	38	14	23	42.6	19
Evansville, Ind.	37	15	22	40.1	19
Dam No. 48, nr. Henderson, Ky.	38	16	23	41.6	20
Mount Vernon, Ind.	35	15	25	39.7	20
Dam No. 49, Uniontown, Ky.	37	16	27	42.1	22
Shawneetown, Ill.	33	14	29	42.4	22
Dam No. 50, Fords Ferry, Ky.	34	14	30	44.9	22
Dam No. 51, Golconda, Ill.	40	19	26	42.1	22–23
Paducah, Ky.	39	Mar. 31	7	41.2	4
		17	29	40.85	25
Dam No. 52, Brookport, Ill.	37	Mar. 24	9	43.1	5
		14	May 11	43.3	25
Dam No. 53, near Mound City, Ill.	42	Mar. 23	9	48.0	5
		14	[2]	50.5	26–28
Cairo, Ill.	40	Mar. 21	10	45.6	5
		13	May 18	51.2	29
White Basin					
Current: Doniphan, Mo.	10	23	25	13.5	24
Black:					
Poplar Bluff, Mo.	16	24	26	17.4	25
Black Rock, Ark.	14	11	May 12	19.5	12
				21.7	24–25
White:					
Georgetown, Ark.	21	12	May 13	22.2	18–19
				22.7	27
Des Arc, Ark.	24	18	23	24.3	20–22
		26	[2]	24.6	28
		Mar. 25	8	27.1	Mar. 31–Apr. 3
Clarendon, Ark.	26	15	May 21	27.8	23–24, May 9–11.
St. Charles, Ark.	25	Mar. 26	[2]	26.1	4
				------	------
Arkansas Basin					
Little Arkansas: Sedgwick, Kans.	18	11	14	22.6	12
		22	26	24.2	22
Ninnescah: Peck, Kans.	17	22	23	21.0	23
Cimarron: Perkins, Okla.	11	10	12	14.1	11
		23	23	12.3	23

[1] Provisional. [2] Continued into May.

FLOOD-STAGE REPORT FOR APRIL 1944—Continued

River and station	Flood stage	Above flood stages—dates		Crest [1]	
		From—	To—	Stage	Date
MISSISSIPPI SYSTEM—continued					
Arkansas Basin—Continued					
	Feet			*Feet*	
Verdigris:					
Independence, Kans.	36	10	13	43.1	11
		24	26	43.7	24
Claremore, Okla.	32	11	18	47.4	13
		25	[2]	------	------
Cottonwood:					
Cottonwood Falls, Kans.	9	22	25	16.0	23
Emporia, Kans.	20	10	14	24.6	11
		22	29	27.7	23
Neosho:					
Neosho Rapids, Kans.	22	11	13	25.8	12
		23	28	28.2	23
		10	15	30.7	11
Burlington, Kans.	23			32.0	13
		22	[2]	35.0	24
		10	16	19.3	12
Iola, Kans.	15	22	[2]	22.65	25
		10	17	25.8	12
Chanute, Kans.	20	23	[2]	29.6	26
		11	18	25.6	13
Parsons, Kans.	22	24	[2]	29.7	27
		10	19	22.6	12
Oswego, Kans.	17	23	[2]	25.9	28
North Canadian:					
Canton, Okla.	9	22	22	9.6	28
Yukon, Okla.	11	9	14	14.2	11
		24	25	13.0	24
Canadian: Union, Okla.	7	10	10	8.0	10
Petit Jean: Danville, Ark.	20	12	13	20.8	12
Arkansas:					
Wichita, Kans.	9	23	27	12.0	23
Oxford, Kans.	14	23	25	15.7	24
Arkansas City, Kans.	16	12	13	17.1	13
		23	28	25.2	24
Ralston, Okla.	16	24	27	23.5	25
Tulsa, Okla.	12	11	13	13.9	11
		25	28	17.0	26
		12	13	25.5	12
Webbers Falls, Okla.	23	14	20	24.7	17–18
		26	29	25.8	27
		30	[2]	------	------
		12	14	23.85	13
Fort Smith, Ark.	22	17	20	23.1	18
		28	[2]	24.0	28
Van Buren, Ark.	22	13	21	24.7	13
		27	[2]	24.2	28
		14	15	23.4	14
Dardanelle, Ark.	22	18	21	22.5	20
		28	May 11	23.3	29
				------	------
Red Basin					
Saline: Benton, Ark.	20	23	24	26.7	23
Ouachita:					
		3	3	17.6	3
Arkadelphia, Ark.	17	10	10	18.0	10
		12	12	17.1	12
		22	26	25.6	24
		Mar. 20	18	34.2	Mar. 24–25
Camden, Ark.	26	25	May 14	33.1	28
				------	------
Monroe, La.	40	16	20	40.2	17–19
Sulphur: Naples, Tex.	22	5	10	23.3	9–10
Lower Mississippi Basin					
Big Lake Outlet: Manila, Ark.	10	12	[2]	15.5	18–19
Tallahatchie: Swan Lake, Miss.	26	Mar. 30	20	30.2	3
Yazoo:					
Greenwood, Miss.	35	1	17	38.4	4–5
Yazoo City, Miss.	29	Mar. 28	[2]	30.8	Mar. 29
				33.65	27
Mississippi:					
New Madrid, Mo.	34	Mar. 31	9	35.7	5
		15	May 17	40.4	30
Memphis, Tenn.	34	23	May 17	------	------
Helena, Ark.	44	29	May 18	------	------
Red River Landing, La.	45	28	[2]	------	------
Baton Rouge, La.	35	24	[2]	------	------
Donaldsonville, La.	28	29	[2]	------	------
Atchafalaya:					
Melville, La.	37	28	[2]	------	------
Atchafalaya, La.	25	10	[2]	------	------
WEST GULF OF MEXICO DRAINAGE					
Nezpique Bayou: Basile, La.	18	Mar. 19	1	23.4	Mar. 22
Elm Fork: Carrollton, Tex.	6	------	------	6.0	3
East Fork: Rockwall, Tex.	10	3	5	12.9	4
		30	[2]	------	------

[1] Continued into April. April reports not yet available. [2] Estimated.

CLIMATOLOGICAL DATA

CONDENSED CLIMATOLOGICAL SUMMARY OF TEMPERATURE AND PRECIPITATION BY SECTIONS

[For description of tables and charts, see REVIEW January 1943, p. 15

In the following table are given for the various sections of the climatological service of the Weather Bureau the monthly average temperature and total rainfall; the stations reporting the highest and lowest temperatures, with dates of occurrence; the stations reporting the greatest and least total precipitation; and other data as indicated by the several headings.

The mean temperature for each section, the highest and lowest temperatures, the average precipitation, and the greatest and least monthly amounts are found by using all trustworthy records available.

The mean departures from normal temperatures and precipitation are based only on records from stations that have 10 or more years of observations. Of course, the number of such records is smaller than the total number of stations.

Section	Temperature							Precipitation					
			Monthly extremes							Greatest monthly		Least monthly	
	Section average	Departure from the normal	Station	Highest	Date	Station	Lowest	Date	Section average	Departure from the normal	Station	Amount	Station	Amount
	°F.	°F.		°F.			°F.		In.	In.		In.		In.
Alabama	62.9	−0.6	Geneva	91	22	Valley Head	23	1 5	9.29	+4.66	Mobile Airport	15.59	Moulton	3.40
Arizona	54.8	−3.6	4 stations	94	1 3	Bright Angel R. S.	11	21	.86	+.18	Sedona R. S.	2.99	Mohawk	.00
Arkansas	60.1	−1.4	Okay	88	15	Lead Hill	19	5	6.65	+1.69	Mountain Valley	12.59	Gilbert	3.45
California	52.5	−3.0	Imperial	99	1	Ellery Lake	−9	21	2.02	+.27	West Branch	7.85	2 stations	.00
Colorado	39.6	−4.2	3 stations	77	1 4	2 stations	−13	2	3.47	+1.65	Graft	8.40	Del Norte	.28
Florida	71.5	+1.7	2 stations	97	1 20	Niceville	28	6	4.06	+1.14	Pensacola	12.05	Cedar Key	.30
Georgia	62.3	−1.0	Brooklet	91	11	Blairsville	19	6	6.86	+3.05	Eastman	16.48	Savannah Beach	2.87
Idaho	44.1	−1.1	Lewiston	85	4	Landmark	1	2	2.29	+.84	Pierce	4.90	Idaho Falls Airport	.49
Illinois	50.4	−1.9	Harrisburg	82	21	Danville	17	3	6.51	+2.94	Carlinville	10.97	Wheaton	2.67
Indiana	50.8	−1.0	Huntingburg	85	21	Marengo	14	5	6.20	+2.61	Farmersburg	8.82	Albion	3.43
Iowa	45.0	−3.8	Keosauqua	78	30	Onawa	14	5	4.55	+1.83	Riverton	8.62	Sibley	1.58
Kansas	49.4	−5.4	Parsons	85	21	Tribune	12	18	7.25	+4.61	Fort Riley	13.05	Richfield	3.20
Kentucky	55.6	−.5	4 stations	89	1 21	2 stations	17	1 4	4.73	+.74	Lockport	7.27	Monticello	3.26
Louisiana	66.7	−.3	Esler Field	91	26	Pine Grove	30	4	4.99	+.32	New Orleans	9.81	Lafayette	2.78
Maryland-Delaware	51.1	−1.1	3 stations	84	1 9	Mount Savage Summit, Md.	13	5	4.14	+.62	Dover, Del	6.21	Luke, Md	2.61
Michigan	39.5	−3.2	Wayne	80	30	2 stations	−6	3	2.13	−.23	Adrian	4.30	Channing	.91
Minnesota	40.0	−3.1	3 stations	72	1 27	do	−5	2	2.01	−.09	Milaca	4.11	Babbitt	.05
Mississippi	63.9	−.7	2 stations	89	15	Holly Springs	28	5	6.99	+2.11	Hickory	13.23	Fleet	3.64
Missouri	52.2	−3.1	Marble Hill	89	15	Albany	16	5	6.68	+2.66	Sedalia	12.77	Tecumseh	1.08
Montana	44.3	+1.0	Libby	81	28	West Yellowstone	4	2	.92	−.22	Kings Hill	4.65	Turner	.00
Nebraska	44.0	−3.3	2 stations	77	1 8	Sidney	3	18	4.76	+2.33	Wahoo	10.78	Ellsworth	.53
Nevada	45.7	−2.4	Las Vegas	88	4	Marlette Lake	4	21	1.09	+.28	Lamoille	5.77	3 stations	T
New England	40.4	−3.2	Norwalk, Conn	80	30	Lake Frontiere, Maine	−10	5	3.59	+.26	Hatchville, Mass	5.70	Caribou, Maine	.92
New Jersey	47.9	−1.7	Flemington	82	30	Layton	6	6	5.45	+1.80	Vineland	7.37	Cape May	3.16
New Mexico	48.8	−2.7	Obar	93	21	Truchas	1	4	.99	+.08	Lake Malaya	7.42	7 stations	.00
New York	40.9	−3.3	Bedford Hills	83	30	Newcomb	2	5	3.90	+.90	Babylon	6.48	Massena	2.08
North Carolina	58.0	+.1	3 stations	89	1 10	Mount Mitchell	1	5	4.47	+.56	Salisbury	7.21	Jefferson	2.01
North Dakota	40.8	−.7	New Hradec	77	29	Bottineau	−11	1	.80	−.64	Milnor	1.95	Pembina Airport	.06
Ohio	48.2	−1.6	3 stations	89	22	Paulding	10	4	4.25	+1.06	Van Wert	6.86	Canfield	2.80
Oklahoma	58.3	−2.1	Hollis	93	21	Kenton	21	18	4.02	+.55	Woodward	8.51	Waurika	1.35
Oregon	48.6	−1.7	McKenzie Bridge	86	2	3 stations	9	1 17	2.45	+.45	Tidewater	9.92	Harper	.19
Pennsylvania	45.5	−3.1	6 stations	81	30	Wellsboro	6	6	4.04	+.60	Kregar	6.52	Ansonia	2.24
South Carolina	62.0	−.3	2 stations	91	11	Caesars Head	18	5	4.74	+1.49	Yemassee	8.09	Myrtle Beach	2.43
South Dakota	42.4	−3.5	Ardmore	76	12	3 stations	12	1 11	1.96	−.12	Fairfax	5.73	Van Metre	.72
Tennessee	57.4	−1.3	2 stations	87	22	2 stations	20	5	5.37	+.97	Bolivar	10.91	Kingsport	2.70
Texas	65.5	−.6	Rio Grande	105	22	do	23	18	2.02	−.90	Longview	12.82	6 stations	.00
Utah	43.7	−3.5	St. George	81	3	Soldier Summit	3	15	2.88	+1.64	Lower Mill Creek	7.47	Hanksville	.27
Virginia	54.0	−.5	2 stations	89	10	Floyd	11	5	3.08	−.21	Saluda	5.72	Roanoke	1.44
Washington	48.6	+.2	Wahluke (near)	88	28	Stockdill Ranch	19	18	2.77	+.62	Highley Peak	11.44	Dallesport	.45
West Virginia	50.7	−1.0	2 stations	90	22	Pickens	11	5	4.43	+.89	Kumbrabow	9.20	Brandywine	1.79
Wisconsin	40.7	−3.0	2 stations	74	1 29	Prentice	1	4	2.41	−.09	Milwaukee	4.01	Deerskin Dam	1.09
Wyoming	39.8	−.6	Fort Laramie	76	5	Foxpark	−13	2	2.10	+.47	Middle Fork	6.31	Deaver	.28
Alaska [March]	14.9	+1.2	Tree Point	55	20	Shungnak	−59	29	1.94	+.14	Little Port Walter	33.29	Point Lay	.09
Hawaii	71.1	+1.5	Waiane, Oahu	89	1 14	Haleakala R. S., Maui	41	1 4	6.05	−2.22	Kukui, Maui	46.00	16 stations	.00
Puerto Rico	75.9	+1.0	Manati	97	5	Garzas	50	1	2.21	−1.79	Guajataca Dam	7.71	Santa Isabel	.19

[1] Other dates also.

CLIMATOLOGICAL DATA FOR WEATHER BUREAU STATIONS

District and station	Elevation of instruments: Barometer above sea level	Elevation of instruments: Thermometer above ground	Elevation of instruments: Anemometer above ground	Pressure: Station	Pressure: Sea level	Pressure: Departure from normal	Temperature of the air: Mean max. + mean min. ÷ 2	Temperature of the air: Departure from normal	Temperature of the air: Maximum	Temperature of the air: Date	Temperature of the air: Mean maximum	Temperature of the air: Minimum	Temperature of the air: Date	Temperature of the air: Mean Minimum	Temperature of the air: Greatest daily range	Mean temperature of the dew-point	Mean relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Days with 0.01 inch or more	Wind: Average hourly velocity	Wind: Prevailing direction	Wind: Maximum velocity: Miles per hour	Wind: Maximum velocity: Direction	Wind: Maximum velocity: Date	Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month	Number of days with thunderstorms
	Ft.	*Ft.*	*Ft.*	*Mbs.*	*Mbs.*	*Mbs.*	°F.	°F.	°F.		°F.	°F.		°F.	°F.	°F.	%	*In.*	*In.*		*Mi.*								*0–10*	*In.*	*In.*	
New England							41.5	−1.8									71	3.81	+0.8										6.0			
Eastport	75	67	85	1,010.5	1,013.9	+0.4	38.2	−0.8	70	30	45	25	4	31	33	27	68	3.21	+0.4	8	9.8	w.	35	e.	12	11	10	9	5.3	2.1	0.0	0
Greenville, Maine	1,070	6	41	974.3	1,014.9	.....	33.0	−4.1	63	29	45	2	5	21	46	30	...	2.30	−.6	7	....	nw.	.....	.....	.....	8	12	10	.....	9.8	T	0
Portland, Maine [1]	103	5	43	1,010.5	1,014.9	+.3	38.9	−4.1	73	30	49	19	4	29	37	32	78	3.90	+.5	11	9.4	w.	31	w.	14	15	3	12	4.7	1.0	.0	0
Concord [1]	289	4	45	1,004.1	1,015.2	−.4	39.8	−1.8	73	30	51	15	4	28	43	28	65	3.14	+.4	12	8.2	nw.	28	nw.	14	10	7	13	5.7	.3	.0	0
Burlington [1]	403	6	51	1,000.0	1,015.6	.0	38.7	−4.6	71	30	48	21	6	29	40	29	72	3.22	+1.1	13	8.6	nw.	28	s.	1	8	9	13	6.2	3.1	.0	0
Boston [1]	124	33	62	1,010.2	1,015.2	−.7	44.6	−1.8	75	30	52	29	6	38	27	30	64	3.52	+.2	10	11.6	nw.	36	ne.	28	8	7	15	6.1	T	.0	0
Nantucket	12	11	59	1,014.2	1,014.9	.0	44.0	+.6	67	30	50	30	5	38	26	36	80	4.23	+1.3	13	11.4	sw.	33	ne.	28	6	14	6	6.2	T	.0	1
Block Island	26	11	46	1,013.9	1,015.2	.0	43.3	−.7	64	30	49	30	5	38	33	31	82	5.05	+1.5	10	14.2	w.	35	ne.	28	10	9	11	5.7	T	.0	2
Providence [2]	159	46	60	1,009.1	1,015.9	+.7	46.1	−.5	77	30	55	28	4	38	33	31	64	3.82	+.6	8	8.6	nw.	27	nw.	13	7	7	16	6.5	T	.0	0
Hartford [1]	159	5	44	1,009.5	1,015.9	+.3	45.1	−1.6	75	30	55	23	4	35	39	34	70	4.55	+1.2	9	8.8	n.	32	nw.	13	8	6	16	6.6	T	.0	1
New Haven [1]	107	5	39	1,011.5	1,015.9	+.3	45.0	+.1	75	30	53	24	4	37	35	34	69	5.01	+1.8	12	7.6	ne.	24	se.	24	6	6	18	7.0	.2	.0	1
Middle Atlantic States							50.4	−0.8									68	3.87	+0.9										6.6			
Albany [1]	97	26	40	1,011.9	1,015.6	−.3	42.0	−2.4	72	30	51	21	4	33	35	30	68	3.27	+1.1	12	9.2	w.	32	nw.	13	9	4	17	6.5	T	.0	0
Binghamton [2]	871	60	79	983.4	1,016.3	−.3	43.0	−2.4	75	30	52	23	6	34	42	32	72	3.02	+.5	14	5.9	w.	22	nw.	13	6	8	16	6.9	1.8	.0	0
New York	374	415	454	1,003.4	1,015.2	−.7	48.2	−1.2	74	30	56	27	5	40	28	34	62	5.05	+1.8	13	14.8	nw.	52	nw.	24	7	8	15	6.6	4.8	.0	3
Harrisburg [1]	374	30	49	1,002.0	1,015.9	−.7	48.9	−2.0	80	30	58	27	5	40	37	37	69	3.94	+1.2	12	10.6	sw.	41	se.	11	5	7	18	7.2	T	.0	3
Philadelphia [1]	114	6	56	1,011.5	1,016.3	.0	49.4	−1.2	77	30	59	27	5	40	34	37	70	4.69	+1.6	12	12.2	nw.	52	e.	11	6	5	19	7.3	4.8	.0	2
Reading	323	47	306	1,003.7	1,016.3	.....	49.1	−1.6	78	30	58	26	5	40	34	...	...	6.05	+2.8	16	12.2	nw.	25	nw.	12	5	9	16	6.6	2.0	.0	0
Scranton	805	72	104	986.1	1,016.3	.0	45.0	−3.1	76	30	54	25	3	36	38	...	...	3.27	+.5	15	6.6	n.	25	nw.	12	5	9	16	6.8	T	.0	2
Atlantic City	52	37	172	1,013.5	1,016.3	+.4	48.4	+.6	75	30	56	27	6	41	27	40	80	5.79	+2.8	15	16.0	s.	42	se.	11	4	8	18	7.2	2.0	.0	1
Trenton	190	89	107	1,008.8	1,016.3	.....	48.9	−.9	76	30	58	28	6	40	28	36	67	4.94	+2.0	13	9.5	nw.	29	se.	11	6	11	13	6.4	1.7	.0	3
Baltimore [2]	123	100	215	1,011.2	1,016.3	.0	53.0	−.6	80	30	62	30	5	44	28	39	66	3.80	+.5	14	10.6	sw.	34	sw.	12	6	11	13	6.8	.2	.0	2
Washington [2]	112	56	100	1,011.9	1,016.6	.0	53.8	+.5	84	9	63	30	5	44	36	38	63	3.08	−.2	13	8.1	nw.	32	nw.	12	4	13	13	6.8	.2	.0	2
Cape Henry	18	8	54	1,015.2	1,016.3	.....	56.4	+1.8	83	10	65	35	6	48	31	44	71	2.43	−.9	10	12.7	sw.	43	n.	2	8	12	10	5.6	T	.0	4
Lynchburg	686	144	184	991.2	1,016.3	−.3	56.0	−1.3	84	21	67	29	5	45	42	39	64	2.90	.0	12	8.4	sw.	34	w.	12	9	11	10	5.6	T	.0	4
Norfolk [2]	91	80	125	1,013.2	1,016.9	+.6	57.8	+1.0	85	10	67	32	6	48	29	46	74	2.57	−.7	9	10.8	sw.	30	nw.	12	7	11	12	6.0	T	.0	4
Richmond	144	11	52	1,010.2	1,015.6	−1.0	56.7	+.1	84	10	68	30	6	46	36	41	64	3.32	−.2	9	9.6	sw.	30	se.	11	6	17	7	5.5	.0	.0	3
South Atlantic States							61.8	+0.1									73	4.60	+1.6										5.5			
Asheville	2,253	77	92	937.0	1,016.9	.0	54.4	+.5	81	21	66	20	5	43	42	40	67	2.73	−.3	14	9.9	nw.	25	se.	26	7	7	16	6.5	.6	.0	4
Charlotte [3]	779	63	86	988.5	1,016.9	.0	60.0	+.2	85	21	71	28	5	49	35	46	70	5.25	+1.9	16	8.2	sw.	34	sw.	16	10	6	14	5.7	T	.0	3
Greensboro [1]	886	6	56	984.4	1,016.6	.....	56.4	.....	84	10	68	26	5	44	40	44	68	4.84	.....	8	9.6	sw.	32	n.	11	9	6	15	5.8	T	.0	5
Hatteras	11	5	50	1,016.3	1,016.9	+.6	59.8	.0	77	24	66	37	6	53	23	53	82	3.56	.0	9	14.3	sw.	35	n.	13	10	12	8	5.1	.0	.0	3
Raleigh [1]	376	27	69	1,003.1	1,016.9	.0	59.2	+.9	86	10	71	30	6	47	37	46	70	5.46	+2.0	11	11.0	sw.	35	n.	13	11	8	11	5.6	.0	.0	6
Wilmington	72	73	107	1,014.6	1,017.3	+.4	62.2	+.2	82	12	71	33	6	53	26	52	77	3.84	+1.2	8	10.6	sw.	35	sw.	24	13	8	9	5.0	.0	.0	6
Charleston [2]	48	11	92	1,015.2	1,017.3	+.4	64.1	−.4	83	25	71	39	5	57	21	54	80	4.77	+2.2	9	10.3	s.	29	s.	18	8	10	12	5.5	.0	.0	6
Columbia, S. C. [2]	349	70	91	1,004.4	1,017.3	+.4	63.0	−.3	87	11	74	32	6	52	30	50	70	4.29	+1.4	11	8.7	s.	26	sw.	12	10	9	11	5.4	.0	.0	6
Greenville, S. C. [1]	1,040	18	36	979.0	1,016.6	.....	59.0	+.4	82	21	70	29	5	48	32	46	68	5.65	+1.9	13	9.1	sw.	35	sw.	11	12	7	11	5.1	.0	.0	9
Augusta [2]	182	62	77	1,010.2	1,016.9	.0	63.2	−1.0	87	11	74	33	6	52	37	48	66	5.17	+2.0	14	6.1	s.	36	w.	11	11	8	14	4.9	.0	.0	8
Savannah [3]	65	73	152	1,015.2	1,017.6	+.7	66.4	+.4	87	16	74	40	5	58	23	54	76	3.27	+.7	11	11.0	s.	30	e	18	11	11	8	4.9	.0	.0	8
Jacksonville [2]	43	86	110	1,015.9	1,018.0	+.7	69.0	+.3	87	25	77	39	6	61	26	58	78	6.57	+4.2	13	8.4	se.	29	n.	22	8	9	13	5.9	.0	.0	8
Florida Peninsula							75.7	+2.2									77	1.33	−0.9										5.2			
Key West [2]	21	10	64	1,015.6	1,016.6	.0	78.4	+2.7	87	17	83	60	6	74	13	68	76	.75	−.5	6	10.8	e.	26	nw.	4	17	7	6	4.0	.0	.0	1
Miami [2]	25	242	249	1,015.9	1,016.9	.0	75.1	+1.2	86	12	79	47	6	71	25	66	76	2.42	−1.0	5	15.7	se.	33	ne.	30	9	14	7	5.4	.0	.0	1
Tampa [1]	35	6	43	1,015.9	1,017.3	−.7	73.6	+2.7	90	21	82	45	6	65	27	64	79	.81	−1.2	5	10.9	sw.	36	sw.	12	6	12	12	6.2	.0	.0	3
East Gulf States							64.2	−0.6									76	8.74	+4.5										5.9			
Atlanta [1]	1,173	33	72	974.6	1,016.3	−.6	60.2	−.9	82	21	71	31	5	50	35	46	68	6.62	+2.9	14	10.4	nw.	34	w.	16	9	11	10	5.6	.0	.0	9
Macon [3]	370	79	87	1,003.4	1,016.6	−.3	62.4	−1.5	84	16	73	32	6	52	33	50	72	5.72	+2.6	11	7.1	s.	27	sw.	11	10	8	12	5.5	.0	.0	10
Thomasville	273	49	58	1,007.8	1,018.0	+1.1	66.4	−.3	88	22	77	37	6	56	28	...	...	5.45	+2.1	12	.....	.....	...	.....	...	8	7	15	.....	.0	.0	9
Apalachicola	35	11	51	1,015.6	1,016.9	.....	67.3	+.2	83	27	74	44	6	61	19	60	80	7.42	+4.6	9	9.0	e.	29	e.	29	8	7	15	6.2	.0	.0	4
Pensacola	56	54	79	1,014.6	1,016.9	+.3	66.5	−.2	86	27	73	40	6	60	25	58	80	12.05	+8.0	12	9.1	se.	26	se.	30	10	7	13	5.9	.0	.0	11
Anniston	741	9	.....	.....	.....	.....	61.0	−.2	83	15	72	28	6	50	36	...	...	9.70	+4.3	14	.....	se.	...	.....	...	12	9	9	.....	.0	.0	11
Birmingham [1]	700	5	62	991.2	1,016.6	.0	60.6	−1.1	84	15	71	30	5	50	35	48	72	7.82	+3.0	12	9.9	s.	33	s.	11	10	5	15	6.0	.0	.0	10
Mobile [2]	57	86	161	1,014.2	1,016.6	.0	66.0	−.3	85	27	74	39	4	58	27	57	82	14.80	+10.2	13	7.1	s.	33	e.	19	8	8	14	6.0	.0	.0	12
Montgomery [2]	218	92	105	1,008.8	1,016.9	.0	63.8	−1.5	85	15	73	39	6	55	29	54	80	8.80	+4.5	13	7.5	e.	26	sw.	11	11	8	11	5.2	.0	.0	8
Meridian [2]	375	67	92	1,002.4	1,015.9	−.7	62.8	−1.2	85	22	73	32	6	53	36	52	74	11.55	+6.8	11	7.8	s.	22	n.	15	9	8	13	6.0	.0	.0	8
Vicksburg [2]	247	82	102	1,005.8	1,014.6	−1.3	64.3	−1.3	85	22	73	40	4	55	30	54	78	5.14	.0	14	10.3	se.	32	sw.	23	10	6	14	5.9	.0	.0	8
New Orleans [4]	53	80	84	1,013.2	1,015.2	−.7	68.6	+.8	86	27	75	48	4	62	22	60	77	9.81	+4.6	9	7.9	se.	20	nw.	2	10	5	15	6.3	.0	.0	7
West Gulf States							67.1	+0.2									72	2.91	−0.9										5.8			
Shreveport [1]	249	5	64	1,004.4	1,013.2	−1.7	65.2	+.4	85	26	75	39	4	55	33	54	73	5.52	+.9	10	12.0	se.	47	se.	29	8	13	9	5.8	.0	.0	10
Fort Smith	463	57	82	996.3	1,012.5	−2.1	61.2	−.6	85	21	71	37	5	51	31	46	64	4.78	+.8	13	10.5	e.	35	se.	30	8	9	13	6.1	.0	.0	9
Little Rock [1]	357	5	58	1,001.0	1,013.9	−1.3	61.0	−1.1	82	10	70	36	5	52	33	50	73	4.71	−.5	11	11.1	s.	38	sw.	22	6	11	13	6.3	.0	.0	12
Austin [1]	605	10	41	990.5	1,011.9	.....	67.6	−.2	89	26	79	41	4	56	36	52	64	.33	−4.0	3	11.4	s.	35	s.	8	10	7	13	5.4	.0	.0	4
Brownsville [1]	57	5	54	1,008.5	1,010.2	.....	74.4	+.7	90	22	83	47	4	66	29	66	82	1.59	−.1	2	12.8	se.	45	n.	2	3	6	21	7.3	.0	.0	1
Corpus Christi [1]	20	4	33	1,010.8	1,011.2	−3.0	71.6	+2.6	94	26	80	45	4	63	30	63	80	.95	.....	1	13.8	se.	45	se.	9	7	10	13	6.0	.0	.0	1
Dallas [1]	512	5	45	993.6	1,011.9	.....	64.8	−.3	84	21	76	37	3	54	37	51	67	4.69	+.4	6	14.8	s.	34	nw.	8	13	7	10	5.0	.0	.0	8
Fort Worth [1]	679	5	56	987.8	1,011.5	−2.4	64.6	+.5	86	17	76	40	3	54	36	48	61	2.70	−1.3	7	15.5	s.	37	sw.	22	12	8	10	4.9	.0	.0	7
Galveston [2]	54	106	114	1,010.8	1,012.9	−2.0	69.4	+.7	80	20	74	50	3	65	16	62	82	1.98	−1.1	7	12.6	se.	29	se.	22	12	8	10	5.3	.0	.0	3
Houston [2]	138	157	190	1,007.8	1,012.9	.....	70.2	+.9	91	26	78	48	3	62	27	60	78	.58	−3.0	10	12.5	se.	32	se.	30	8	7	15	6.1	.0	.0	3
Palestine	510	64	72	994.9	1,013.2	−1.4	65.7	−.3	86	15	75	42	3	56	30	52	67	4.33	−.1	5	9.6	se.	24	s.	30	8	7	15	6.1	.0	.0	5
Port Arthur	34	59	134	1,011.9	1,013.2	.....	69.2	+.7	84	20	76	44	4	62	22	60	82	2.75	−.2	12	16.5	s.	43	se.	29	9	7	14	5.9	.0	.0	6
San Antonio [1]	693	6	51	987.1	1,011.2	−2.3	68.0	−1.1	91	15	80	38	4	56	39	53	64	.94	−2.2	7	10.6	s.	30	ne.	2	10	5	15	6.0	.0	.0	6

See footnotes at end of table.

CLIMATOLOGICAL DATA FOR WEATHER BUREAU STATIONS—Continued

District and station	Elevation of instruments: Barometer above sea level	Elevation of instruments: Thermometer above ground	Elevation of instruments: Anemometer above ground	Pressure: Station	Pressure: Sea level	Pressure: Departure from normal	Temperature of the air: Mean max. + mean min. ÷ 2	Temperature of the air: Departure from normal	Temperature of the air: Maximum	Temperature of the air: Date	Temperature of the air: Mean maximum	Temperature of the air: Minimum	Temperature of the air: Date	Temperature of the air: Mean Minimum	Temperature of the air: Greatest daily range	Mean temperature of the dew-point	Mean relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Days with 0.01 inch or more	Wind: Average hourly velocity	Wind: Prevailing direction	Wind: Maximum velocity: Miles per hour	Wind: Maximum velocity: Direction	Wind: Maximum velocity: Date	Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month	Number of days with thunderstorms
	Ft.	*Ft.*	*Ft.*	*Mbs.*	*Mbs.*	*Mbs.*	°F.	°F.	°F.		°F.	°F.		°F.	°F.	°F.	%	*In.*	*In.*		*Mi.*								*0–10*	*In.*	*In.*	
Ohio Valley and Tennessee							**53.5**	**−0.5**									**70**	**4.88**	**+1.2**										**6.6**			
Chattanooga [1]	762	6	66	988.8	1,016.6	−.3	57.8	+.2	82	15	70	27	6	46	38	47	74	5.54	+.7	12	9.3	s.	43	w.	15	7	10	13	5.9	.0	.0	7
Knoxville [1]	995	27	53	980.4	1,016.6	−1.4	57.3	.0	84	21	69	28	5	46	36	44	66	3.78	−.4	11	10.0	sw.	62	sw.	11	8	11	11	5.8	T	.0	5
Memphis [1]	399	5	86	1,000.3	1,014.6	−1.3	60.1	−1.7	83	22	70	29	5	51	32	49	71	6.50	+1.7	10	9.4	s.	36	sw.	23	9	4	17	6.2	.0	.0	7
Nashville [1]	546	5	72	995.6	1,015.2	−1.1	57.8	−1.2	82	21	68	28	5	48	36	46	70	3.85	−.3	12	10.9	s.	34	sw.	15	9	8	13	5.9	.0	.0	9
Lexington	989	6	...	979.7	1,016.6	.0	53.8	−.5	85	22	65	20	5	42	34	...	...	4.21	+.7	16	...	s.	...	...	...	9	9	12	5.7	.2	.0	6
Louisville [2]	525	106	120	995.9	1,015.2	−1.1	56.2	−.2	81	22	65	25	5	48	26	44	70	6.47	+2.6	14	10.7	sw.	35	sw.	15	7	10	13	6.3	T	.0	7
Evansville [1]	431	12	40	999.0	1,014.9	−1.0	54.8	−.1	78	23	65	24	5	45	32	42	68	6.35	+2.4	13	10.5	s.	28	sw.	11	5	9	16	6.9	.0	.0	7
Indianapolis [1]	823	5	54	984.8	1,014.9	−1.0	49.8	−1.0	74	23	60	21	5	40	32	40	74	7.90	...	12	11.9	se.	34	sw.	23	4	10	16	7.1	T	.0	6
Terre Haute [2]	575	68	149	993.9	1,015.2	...	52.3	−1.4	76	11	61	24	5	43	31	41	72	6.77	+3.1	13	11.3	n.	33	se.	11	4	10	16	6.9	T	.0	6
Cincinnati [2]	627	11	51	992.2	1,015.6	−.7	53.6	+1.2	80	22	64	23	5	43	33	42	70	4.55	+1.4	17	8.9	sw.	26	sw.	15	5	8	17	6.8	T	.0	6
Columbus [2]	822	90	110	985.4	1,015.2	−1.4	50.8	−.4	76	30	60	23	5	42	33	38	70	3.79	+.9	18	10.2	n.	39	sw.	24	5	5	20	7.4	.1	.0	6
Dayton [1]	1,003	6	55	978.7	1,015.6	...	49.4	−1.1	74	30	59	21	5	40	30	40	75	4.31	+1.1	15	12.4	nw.	38	w.	15	5	4	21	7.5	.4	.0	7
Elkins [2]	1,947	61	78	946.2	1,016.6	−.3	48.4	−.4	81	22	59	20	5	38	42	38	72	5.41	+1.8	20	7.5	w.	29	w.	15	3	9	18	7.3	4.4	.0	5
Parkersburg	637	77	84	992.2	1,015.9	−1.0	52.6	−.8	84	23	64	24	5	42	42	40	66	3.53	+.3	18	7.6	se.	27	se.	11	6	10	14	6.1	.8	.0	6
Pittsburgh [1]	842	39	54	984.4	1,015.2	−1.4	48.4	−.8	76	30	58	19	5	39	32	36	66	3.24	+.3	19	11.1	nw.	35	s.	11	4	9	17	6.8	1.7	.0	4
Lower Lake Region							**42.1**	**−2.8**									**73**	**4.29**	**+1.8**										**6.8**			
Buffalo [1]	768	34	96	987.5	1,016.3	.0	41.1	−2.7	69	30	49	22	4	33	31	32	74	4.62	+2.1	15	12.7	sw.	34	sw.	6	4	10	16	7.0	2.7	.0	2
Canton	448	10	61	999.0	1,015.6	...	38.9	−3.0	69	29	48	20	3	29	36	27	66	2.95	+.8	11	8.9	w.	28	w.	6	7	9	14	6.4	5.3	.0	0
Oswego	335	71	85	1,003.4	1,016.3	.0	39.6	−4.0	63	30	45	23	4	34	30	30	70	3.63	+1.3	12	9.8	w.	30	se.	23	8	9	13	5.8	1.0	.0	0
Rochester [1]	523	5	69	996.6	1,016.3	.0	40.2	−3.3	72	30	48	21	4	32	35	30	72	4.90	+2.6	14	11.1	w.	37	w.	6	5	9	16	7.1	3.2	.0	1
Syracuse [1]	596	5	57	993.9	1,016.3	.0	41.2	−1.8	71	30	50	24	5	32	34	32	74	3.65	+1.2	14	10.5	sw.	32	w.	13	5	10	15	6.8	1.5	.0	0
Erie [2]	714	57	81	989.5	1,016.3	−.3	42.6	−2.5	71	30	49	24	5	36	25	34	80	5.04	+2.3	19	8.0	ne.	31	se.	23	4	6	20	7.4	1.9	.0	4
Cleveland [1]	762	27	54	987.5	1,015.9	−.7	44.9	−1.3	77	30	54	22	5	36	33	34	73	3.86	+1.4	14	10.7	n.	32	sw.	24	5	7	18	7.0	2.3	.0	4
Sandusky	629	5	67	992.6	1,015.9	−.7	44.4	−2.8	79	30	52	24	5	37	36	...	...	3.95	+1.4	14	9.4	e.	26	e.	11	6	8	16	6.6	.4	.0	2
Toledo [1]	628	5	47	992.6	1,016.3	.0	43.2	−3.0	78	30	53	16	4	34	40	34	76	4.80	+2.2	14	12.7	ne.	38	ne.	11	9	8	13	6.1	T	.0	3
Fort Wayne [1]	857	5	53	983.7	1,015.6	...	44.6	−4.1	72	30	54	19	3	35	32	36	74	7.19	+4.1	13	9.1	e.	28	w.	1	4	6	20	7.4	.4	.0	4
Detroit [1]	730	5	78	989.5	1,016.9	+.3	42.9	−2.7	76	30	51	21	4	35	36	32	72	2.62	+.2	14	9.8	e.	30	w.	1	6	6	18	6.9	.9	.0	1
Upper Lake Region							**39.6**	**−1.7**									**70**	**2.28**	**−0.1**										**5.9**			
Alpena	609	5	89	994.6	1,018.0	+1.4	36.8	−1.8	57	19	44	16	4	30	26	28	70	2.31	+.1	9	10.9	nw.	32	e.	23	11	6	13	5.7	4.9	.0	1
Escanaba	612	51	72	994.9	1,018.6	+2.0	37.4	−.5	58	6	45	16	4	30	31	28	72	1.81	−.4	4	10.9	n.	36	e.	23	12	4	14	5.6	.4	.0	1
Grand Rapids [2]	707	70	244	989.8	1,016.6	.0	44.2	−2.8	74	30	53	22	4	36	31	32	71	2.73	.0	13	11.7	e.	47	e.	11	8	6	16	6.6	1.3	.0	2
Lansing [2]	878	5	90	983.7	1,016.6	...	41.8	−3.8	76	30	50	20	3	33	36	32	74	2.45	−.1	16	9.0	ne.	26	ne.	11	8	4	18	6.7	1.4	.0	1
Ludington	637	60	66	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Marquette	734	44	73	990.9	1,018.6	+2.0	36.8	−1.0	69	29	44	16	2	30	32	26	66	2.46	.0	8	7.4	n.	21	w.	28	9	9	12	5.7	7.7	.0	0
Sault Ste. Marie [1]	614	11	52	995.3	1,018.6	+1.7	35.6	−.9	72	30	45	11	2	26	36	24	70	1.35	−.8	8	10.8	nw.	33	e.	24	13	7	10	4.7	1.8	.0	0
Chicago [1]	673	5	36	990.2	1,015.2	−.7	45.3	−1.6	74	23	53	22	4	37	30	34	72	3.33	+.8	14	10.7	ne.	29	e.	11	6	8	16	7.0	T	.0	4
Green Bay	617	109	141	993.9	1,016.9	+.6	40.6	−2.6	70	30	49	17	4	32	33	28	68	1.81	−.8	8	11.1	n.	38	ne.	15	8	8	14	6.4	3.4	.0	1
Milwaukee [1]	681	33	66	990.5	1,015.9	+.3	40.4	−1.8	64	30	48	20	4	33	31	31	72	3.74	+1.1	11	13.4	ne.	41	e.	11	8	7	15	6.6	T	.0	2
Duluth [2]	1,133	5	47	976.6	1,019.0	+2.7	37.0	.0	63	19	45	17	1	29	27	24	70	.78	−1.3	5	13.5	ne.	54	ne.	23	15	6	9	4.4	T	.0	0
North Dakota							**41.6**	**+0.8**									**67**	**0.84**	**−0.8**										**6.0**			
Fargo [1]	940	5	43	983.7	1,018.6	+3.0	41.0	+.4	67	27	52	5	1	30	38	30	70	1.17	−1.0	8	11.3	n.	32	ne.	23	10	7	13	5.7	T	.0	0
Bismarck [1]	1,677	5	43	956.3	1,017.3	+2.4	42.1	+1.7	64	30	53	19	1	31	34	31	70	1.05	−.5	6	11.1	se.	32	se.	28	8	9	13	6.1	.1	.0	0
Devils Lake	1,478	11	44	964.4	1,019.3	+3.7	40.4	+1.7	69	27	52	−2	1	28	37	28	64	.72	−.8	5	8.2	ne.	27	ne.	14	12	4	14	5.6	.7	.0	0
Lemmon, S. Dak.	2,602	4	38	922.8	1,016.6	...	40.8	−1.5	65	30	51	20	3	30	35	31	72	1.19	...	7	...	se.	...	...	...	9	3	18	...	...	...	0
Grand Forks [1]	832	4	41	988.2	1,019.3	...	40.4	...	71	27	52	2	1	28	37	28	...	.62	...	4	...	s.	...	...	...	12	4	14	...	T	.0	0
Williston	1,878	42	50	948.2	1,016.3	+1.7	43.5	+1.5	67	20	54	22	17	33	33	29	60	.42	−.8	4	7.4	se.	24	se.	12	4	11	15	6.8	T	.0	0
Upper Mississippi Valley							**47.2**	**−2.8**									**74**	**5.19**	**+2.1**										**6.8**			
Minneapolis-St. Paul [10]	919	43	74	982.7	1,016.6	+1.0	43.0	−3.4	70	29	52	16	2	34	31	31	68	2.24	.0	10	11.9	ne.	34	ne.	15	10	5	15	6.2	.3	.0	1
Springfield, Minn.	1,025	4	42	978.7	1,016.6	...	42.0	...	69	29	51	22	2	33	32	33	74	2.72	...	8	...	ne.	...	...	...	8	6	16	...	T	.0	1
La Crosse [1]	714	5	29	989.8	1,016.3	+1.1	42.8	−2.8	69	29	52	20	2	33	34	32	73	3.01	−.6	8	8.8	e.	26	nw.	1	7	9	14	6.3	.4	.0	2
Madison [2]	974	70	78	980.0	1,016.3	+.7	42.6	−2.8	66	29	50	21	4	35	28	32	72	2.64	−.1	12	9.6	ne.	30	ne.	15	6	10	14	6.6	.1	.0	3
Charles City	1,015	10	51	979.0	1,016.3	+1.1	44.0	−2.4	71	23	53	23	2	35	33	...	...	2.20	−.3	10	7.1	ne.	23	se.	23	8	7	15	6.4	.2	.0	2
Davenport [1]	606	6	50	992.9	1,015.2	.0	46.4	−2.4	75	23	55	24	3	37	37	37	74	5.55	+2.9	17	12.0	e.	46	e.	11	6	6	18	7.0	T	.0	4
Des Moines [2]	860	5	99	982.7	1,014.2	−.7	46.0	−4.1	73	30	54	24	2	38	35	36	74	4.23	+1.3	18	10.4	n.	34	e.	23	6	5	19	7.3	T	.0	3
Dubuque	699	81	96	989.8	1,015.6	+.4	45.2	−3.4	73	23	54	23	2	36	32	35	72	3.62	+.8	13	6.9	e.	26	e.	11	5	8	17	7.1	.6	.0	2
Burlington [1]	702	4	36	989.2	1,014.9	−.3	46.8	−4.6	74	30	56	24	3	38	37	38	77	6.68	+3.5	16	12.3	ne.	40	ne.	10	4	7	19	7.7	T	.0	5
Cairo	357	5	99	1,001.7	1,014.6	−1.0	57.9	−1.2	78	23	66	30	5	50	26	...	...	6.50	+2.8	12	11.2	sw.	34	sw.	23	7	6	17	6.5	.0	.0	9
Peoria [1]	609	6	26	992.9	1,015.2	−.4	47.4	−2.5	73	23	56	22	4	38	32	39	77	8.32	+4.9	17	12.0	e.	46	e.	11	8	5	17	6.8	.0	.0	6
Springfield, Ill. [2]	636	5	191	991.2	1,014.6	−.6	50.8	−1.9	76	30	60	26	5	42	28	41	80	8.52	+5.0	17	12.8	n.	36	s.	23	3	11	16	7.2	T	.0	8
St. Louis [1]	568	6	303	993.6	1,014.2	−1.0	53.8	−2.3	78	30	62	30	5	45	27	42	71	8.82	+5.0	14	13.2	nw.	44	sw.	23	4	11	15	6.7	.0	.0	7
Missouri Valley							**47.3**	**−4.0**									**76**	**6.73**	**+3.8**										**7.2**			
Columbia, Mo. [2]	784	6	66	985.1	1,013.5	−1.7	51.1	−3.7	82	30	60	26	3	42	31	41	74	9.53	+5.8	17	9.3	n.	27	nw.	21	7	10	13	6.3	T	.0	6
Kansas City [1]	963	38	76	...	1,012.9	−1.7	50.3	−4.5	78	30	59	25	5	42	...	41	74	10.57	+7.0	16	11.7	ne.	40	n.	22	5	8	17	...	...	.0	10
St. Joseph [2]	967	11	49	1,012.2	1,013.9	...	48.8	−4.7	77	30	57	25	5	40	32	40	78	10.88	+7.7	16	9.8	n.	29	w.	24	10	7	13	6.2	.2	.0	5
Springfield, Mo. [1]	1,324	5	60	965.5	1,012.9	−2.0	52.3	−2.9	79	21	62	24	5	42	33	43	74	3.84	.0	14	14.4	se.	47	sw.	14	3	11	16	7.3	T	.0	10
Topeka	987	65	87	977.3	1,013.2	...	50.2	−4.5	78	30	59	27	5	42	33	42	78	8.65	+5.9	16	10.1	n.	34	e.	10	6	8	16	6.9	T	.0	9
Lincoln [2]	1,189	11	81	970.9	1,014.6	+.7	45.6	−5.9	71	30	53	23	5	38	33	36	80	9.10	+6.6	16	9.9	n.	31	nw.	23	4	3	23	8.1	5.2	.0	5
Omaha [1]	1,105	5	68	974.3	1,014.6	+.4	46.2	−4.8	71	30	54	22	5	38	33	38	78	6.38	+3.9	18	12.7	n.	45	ne.	10	3	6	21	7.8	1.7	.0	3
Valentine	2,598	46	54	922.5	1,015.2	+1.3	41.8	−3.9	62	7	51	23	16	33	31	32	71	.98	−.9	9	9.7	n.	28	n.	23	5	7	18	7.3	1.3	.0	0
Sioux City [1]	1,138	5	40	973.6	1,015.2	+1.0	44.4	−2.8	71	29	54	22	5	35	34	36	78	3.77	+1.1	15	11.3	ne.	30	se.	29	3	6	21	7.9	T	.0	0
Huron [1]	1,301	5	41	968.8	1,016.9	+2.3	42.6	−2.5	67	8	52	21	16	33	34	35	79	3.61	+1.4	8	12.3	n.	34	n.	23	7	7	16	6.7	1.4	.0	0

See footnotes at end of table.

CLIMATOLOGICAL DATA FOR WEATHER BUREAU STATIONS—Continued

District and station	Elevation of instruments: Barometer above sea level	Elevation of instruments: Thermometer above ground	Elevation of instruments: Anemometer above ground	Pressure: Station	Pressure: Sea level	Pressure: Departure from normal	Temperature of the air: Mean max. + mean min. ÷ 2	Temperature of the air: Departure from normal	Temperature of the air: Maximum	Temperature of the air: Date	Temperature of the air: Mean maximum	Temperature of the air: Minimum	Temperature of the air: Date	Temperature of the air: Mean Minimum	Temperature of the air: Greatest daily range	Mean temperature of the dew-point	Mean relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Days with 0.01 inch or more	Wind: Average hourly velocity	Wind: Prevailing direction	Wind: Maximum velocity: Miles per hour	Wind: Maximum velocity: Direction	Wind: Maximum velocity: Date	Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month	Number of days with thunderstorms
	Ft.	*Ft.*	*Ft.*	*Mbs.*	*Mbs.*	*Mbs.*	°F.	°F.	°F.		°F.	°F.		°F.	°F.	°F.	%	*In.*	*In.*		*Mi.*								*0–10*	*In.*	*In.*	
Northern Slope							**44.5**	**+0.4**									**64**	**2.13**	**+0.6**										**7.1**			
Billings [1]	3,570	16	40	887.9	1,011.5	.....	48.6	+2.6	75	4	60	28	17	37	38	30	54	.10	.....	4	10.7	ne.	38	nw.	6	4	8	18	7.1	T	.0	1
Havre	2,507	11	67	924.1	1,013.5	.0	48.3	+4.6	73	27	62	25	17	34	43	30	56	.46	−.5	4	8.3	e.	28	sw.	12	5	9	16	6.8	T	.0	1
Helena [1]	4,124	5	43	870.3	1,012.9	−2.0	44.3	+.8	73	4	58	24	19	31	44	31	64	.55	−.6	8	8.5	w.	35	nw.	29	3	6	21	7.7	T	.0	2
Missoula [2]	3,205	80	91	899.1	1,013.2	.....	47.2	+1.9	74	4	59	29	18	35	40	30	58	1.11	+.1	6	6.8	e.	29	ne.	23	4	7	19	7.5	T	.0	0
Kalispell	2,973	48	56	908.9	1,012.2	−2.4	45.3	+1.7	72	4	58	26	8	33	38	30	59	.97	+.2	7	6.2	w.	24	w.	30	2	11	17	7.2	T	.0	0
Miles City [1]	2,371	5	28	929.2	1,013.9	−.7	47.1	.....	70	12	60	24	2	34	37	33	64	1.53	.....	7	.....	se.	.....	.....	.....	4	9	17	7.0	T	.0	0
Rapid City [1]	3,259	5	63	900.1	1,014.9	+.7	42.5	−1.6	70	12	53	24	19	32	37	31	70	1.54	+.1	6	15.0	nw.	47	s.	28	5	10	15	6.7	T	.0	0
Cheyenne [1]	6,094	5	40	808.7	1,012.9	.0	37.8	−3.1	66	4	49	10	18	27	37	29	76	2.85	+.9	11	11.9	nw.	33	nw.	6	4	9	17	7.0	8.0	.0	1
Lander	5,352	60	68	831.0	1,011.9	−2.0	41.0	−1.4	65	4	51	24	11	30	39	28	64	5.24	+3.2	12	5.2	sw.	30	sw.	7	3	11	16	7.0	23.4	.0	1
Sheridan [1]	3,790	5	38	881.1	1,013.2	.....	45.3	+2.0	71	4	57	24	18	33	40	32	66	2.81	+.9	12	9.6	nw.	38	nw.	30	4	10	16	7.1	T	.0	0
North Platte [2]	2,821	11	51	914.0	1,013.5	+.3	44.4	−4.2	70	6	54	25	16	35	34	33	73	3.61	+1.6	12	10.1	n.	31	n.	23	5	7	18	7.4	4.2	.0	2
Middle Slope							**49.9**	**−4.2**									**70**	**4.98**	**+2.4**										**6.7**			
Denver [2]	5,292	106	113	833.7	1,011.9	−.6	43.2	−3.9	70	5	52	22	18	34	32	28	64	3.15	+1.1	12	8.7	s.	34	se.	28	6	10	14	6.4	19.5	.0	1
Pueblo [1]	4,690	5	36	852.7	1,011.2	−.7	44.0	−5.4	74	4	56	22	11	32	48	30	66	2.47	+1.2	11	9.8	nw.	38	w.	6	7	6	17	6.9	10.7	.0	2
Concordia	1,392	50	58	963.4	1,013.9	+.4	47.2	−6.3	74	30	55	24	5	39	31	38	76	5.26	+2.9	15	9.4	ne.	30	n.	23	4	7	19	7.5	7.5	.0	7
Dodge City [1]	2,509	5	58	923.8	1,011.9	−.6	48.0	−5.6	76	8	58	28	5	38	36	38	76	4.13	+2.2	12	19.2	se.	62	ne.	9	5	9	16	7.0	T	.0	12
Wichita [1]	1,358	6	64	963.4	1,011.9	−1.6	51.4	−5.0	77	21	61	29	5	42	33	41	72	12.42	+9.5	13	17.0	se.	56	ne.	22	5	8	17	7.1	T	.0	12
Oklahoma City [2]	1,214	10	47	968.2	1,011.2	−2.0	58.0	−1.8	83	9	68	35	3	47	36	44	65	4.87	+1.6	8	11.1	s.	34	sw.	8	8	7	15	5.9	.0	.0	7
Tulsa [1]	674	10	61	987.8	1,012.2	.....	57.2	−1.7	84	21	67	32	3	47	33	45	69	2.62	−1.6	7	13.6	se.	42	s.	6	6	13	11	6.3	.0	.0	9
Southern Slope							**61.6**	**−0.4**									**50**	**0.88**	**−0.9**										**4.4**			
Abilene [1]	1,738	4	41	949.5	1,009.5	−3.0	64.4	+1.4	95	21	78	32	3	50	36	43	54	.59	−2.1	4	15.6	s.	38	sw.	6	17	9	4	3.7	.0	.0	4
Amarillo [1]	3,676	5	42	884.9	1,009.8	−1.7	52.7	−1.1	80	8	67	26	18	38	44	33	58	1.83	.0	5	17.8	se.	46	se.	16	7	15	8	5.4	.0	.0	4
Del Rio	960	63	71	976.6	1,009.1	−3.1	71.6	+1.0	95	9	84	41	4	59	38	50	53	1.05	−.7	1	10.9	se.	29	w.	10	10	13	7	4.9	.0	.0	1
Roswell	3,566	75	85	888.3	1,008.5	−2.3	57.6	−3.0	82	6	73	30	23	42	50	25	35	.07	−.8	2	10.5	w.	36	nw.	22	17	10	3	3.7	.0	.0	0
Southern Plateau							**58.4**	**−1.7**									**39**	**0.64**	**+0.1**										**4.2**			
El Paso [1]	3,778	5	85	882.5	1,008.1	−2.1	61.6	−.7	84	27	76	35	4	48	43	24	26	T	−.3	0	14.9	w.	53	w.	9	17	11	2	3.2	.0	.0	0
Albuquerque [1]	5,314	5	48	833.4	1,008.1	.....	52.2	−1.8	78	5	66	29	3	39	38	26	42	.91	+.3	5	12.9	nw.	49	se.	27	8	10	12	5.7	3.0	.0	2
Flagstaff	6,907	36	51	786.3	1,012.2	+1.7	40.5	−2.8	65	3	53	20	22	28	43	22	54	1.84	+.5	9	.....	w.	.....	.....	.....	10	6	14	5.9	11.2	.0	3
Phoenix [2]	1,107	39	87	971.9	1,009.8	−1.7	64.8	−2.2	91	4	78	44	22	51	39	36	41	.50	+.1	3	7.7	e.	32	w.	16	14	6	10	4.4	.0	.0	0
Tucson [1]	2,555	6	30	923.1	1,010.2	.....	63.0	−1.4	88	4	78	36	9	48	40	29	33	.56	+.2	1	.....	sw.	.....	.....	.....	15	10	5	3.6	.0	.0	1
Yuma	142	9	54	1,006.1	1,010.5	−1.7	68.0	−1.5	94	4	83	48	10	53	40	37	38	T	−.1	0	7.2	w.	30	w.	8	21	7	2	2.6	.0	.0	0
Independence	3,957	5	26	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Middle Plateau							**44.6**	**−3.2**									**57**	**1.57**	**+0.7**										**7.0**			
Reno [1]	4,227	20	52	859.8	1,013.2	−1.7	43.8	−2.3	73	30	60	14	17	28	50	26	55	.20	−.3	5	9.2	nw.	34	s.	11	3	13	14	6.8	1.5	.0	1
Tonopah	6,090	9	20	810.4	1,011.5	.....	42.6	−5.1	64	2	54	20	21	32	32	25	55	.51	.0	5	.....	nw.	.....	.....	.....	10	13	7	.....	T	.0	0
Winnemucca	4,339	5	56	864.9	1,012.5	−2.4	44.2	−2.5	74	2	57	19	17	32	45	28	57	1.21	+.4	9	8.2	sw.	26	sw.	11	1	10	19	8.0	T	.0	1
Modena	5,473	10	46	823.3	1,009.1	−2.8	42.9	−3.1	68	3	57	23	6	29	43	.....	.....	.95	+.1	8	9.9	w.	32	sw.	8	5	11	14	6.6	3.6	.0	3
Salt Lake City [1]	4,227	32	58	863.2	1,011.2	−2.0	46.2	−1.7	73	3	57	28	15	36	38	33	65	4.90	+3.2	14	9.3	se.	34	se.	8	4	11	15	6.8	6.4	.0	5
Grand Junction	4,602	60	68	855.1	1,009.5	−2.4	48.0	−4.4	72	4	59	27	15	37	36	28	52	1.67	+.8	11	7.0	se.	30	s.	28	5	7	18	6.9	T	.0	4
Northern Plateau							**48.3**	**−0.6**									**63**	**1.75**	**+0.6**										**7.1**			
Baker [2]	3,471	36	54	892.7	1,013.2	−2.7	44.4	−.8	69	3	56	21	17	33	37	30	63	.53	−.6	8	6.9	n.	23	sw.	6	5	7	18	6.8	2.6	.0	1
Boise [1]	2,739	5	49	916.4	1,011.9	−3.3	48.9	−.2	78	3	60	26	1	38	37	34	61	2.92	+1.7	12	12.7	nw.	36	nw.	20	4	11	15	7.2	T	.0	0
Pocatello [1]	4,478	5	31	858.5	1,011.9	−2.0	43.6	−1.3	70	4	54	25	2	33	43	31	66	1.56	+.1	15	10.8	sw.	29	sw.	14	2	9	19	7.7	8.9	.0	2
Spokane [1]	1,929	27	42	944.5	1,013.2	−2.4	47.9	−.5	78	28	60	28	16	36	40	34	62	1.40	+.3	7	7.3	ne.	29	sw.	30	3	7	20	7.8	T	.0	0
Walla Walla	991	57	65	978.0	1,013.5	−2.8	53.0	−.1	82	3	63	36	20	43	38	.....	.....	2.45	+.9	12	6.8	s.	21	sw.	13	7	11	12	6.0	.0	.0	0
Yakima	1,076	58	67	974.3	1,013.2	.....	51.8	−.7	80	28	63	33	16	40	36	.....	.....	1.62	+1.2	9	6.6	nw.	21	sw.	14	4	9	17	7.2	.0	.0	2
North Pacific Coast Region							**50.2**	**+0.4**									**75**	**3.59**	**+0.5**										**8.0**			
North Head	211	5	56	1,007.8	1,015.2	−2.4	48.6	+1.1	73	1	54	40	20	44	31	43	84	4.26	+.1	22	14.4	s.	45	s.	13	2	5	23	8.1	.0	.0	0
Seattle [2]	125	90	321	1,010.5	1,014.9	−2.0	51.8	+.7	79	2	60	40	16	44	34	40	70	2.01	−.4	14	9.8	s.	34	sw.	14	1	9	20	7.7	.0	.0	0
Tacoma	194	172	201	1,008.1	1,014.9	−2.0	50.6	+1.9	78	2	58	38	16	43	34	.....	.....	3.31	+.5	15	9.2	sw.	28	sw.	12	4	10	16	6.9	.0	.0	2
Tatoosh Island	86	9	61	1,011.5	1,014.2	−1.4	47.8	+1.7	62	27	52	39	16	43	17	41	79	6.56	+.9	23	13.4	s.	40	s.	10	1	3	26	8.4	.0	.0	0
Medford	1,329	29	58	968.5	1,015.9	.....	49.2	−2.9	81	2	60	30	25	38	42	37	68	1.97	+.6	14	.....	nw.	.....	.....	.....	1	6	23	8.3	T	.0	2
Portland, Oreg. [2]	154	68	106	1,010.5	1,015.6	−2.4	52.6	+.8	81	2	60	38	25	45	30	42	76	3.13	+.3	17	6.7	se.	20	w.	6	2	5	23	8.1	.0	.0	0
Roseburg	510	45	76	998.0	1,016.6	−1.7	50.7	−.3	83	2	60	34	25	41	42	40	73	3.89	+1.6	19	4.3	sw.	23	sw.	19	1	4	25	8.4	.0	.0	1
Middle Pacific Coast Region							**53.5**	**−2.2**									**72**	**2.64**	**+0.4**										**6.4**			
Eureka	60	72	88	1,016.9	1,018.6	−1.0	49.9	.0	63	26	55	40	21	45	16	44	82	4.25	+.9	21	7.5	n.	24	nw.	8	2	9	19	7.5	.0	.0	1
Redding [1]	722	20	34	989.2	1,014.9	.....	55.1	−4.7	82	1	64	36	20	46	32	38	58	2.60	.0	11	7.9	nw.	33	w.	15	4	6	20	7.2	.0	.0	8
Sacramento	66	92	115	1,013.9	1,015.6	−.7	55.9	−2.2	82	1	67	38	21	45	32	43	68	1.66	+.2	10	7.9	sw.	22	sw.	11	10	9	11	5.3	.0	.0	2
San Francisco [2]	155	112	132	1,012.2	1,017.3	−.3	53.2	−1.8	62	5	58	46	16	49	14	46	80	2.07	+.5	8	10.5	w.	30	w.	7	6	15	9	5.8	.0	.0	0
South Pacific Coast Region							**58.8**	**+0.7**									**65**	**0.78**	**−0.1**										**5.2**			
Fresno [1]	327	5	35	1,003.7	1,015.2	−.4	58.2	−2.0	87	2	70	37	9	46	38	40	58	1.13	+.2	6	8.0	nw.	34	nw.	8	9	10	11	5.3	.0	.0	1
Los Angeles	338	223	250	1,003.4	1,014.6	−1.0	58.8	−.6	73	3	68	46	14	50	23	45	66	.60	−.4	2	7.5	w.	33	w.	8	11	12	7	4.9	.0	.0	0
San Diego [1]	87	20	55	1,012.5	1,015.2	−.4	59.5	+.5	70	3	67	46	22	52	23	48	70	.61	−.2	4	7.6	w.	29	sw.	8	8	12	10	5.4	.0	.0	0
West Indies																																
San Juan, P. R.	82	10	54	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

See footnotes at end of table.

CLIMATOLOGICAL DATA FOR WEATHER BUREAU STATIONS—Continued

District and station	Elevation of instruments: Barometer above sea level	Elevation of instruments: Thermometer above ground	Elevation of instruments: Anemometer above ground	Pressure: Station	Pressure: Sea level	Pressure: Departure from normal	Temperature of the air: Mean max. + mean min. ÷ 2	Temperature of the air: Departure from normal	Temperature of the air: Maximum	Temperature of the air: Date	Temperature of the air: Mean maximum	Temperature of the air: Minimum	Temperature of the air: Date	Temperature of the air: Mean Minimum	Temperature of the air: Greatest daily range	Mean temperature of the dew-point	Mean relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Days with 0.01 inch or more	Wind: Average hourly velocity	Wind: Prevailing direction	Wind: Maximum velocity: Miles per hour	Wind: Maximum velocity: Direction	Wind: Maximum velocity: Date	Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month	Number of days with thunderstorms
	Ft.	*Ft.*	*Ft.*	*Mbs.*	*Mbs.*	*Mbs.*	°*F.*	°*F.*	°*F.*		°*F.*	°*F.*		°*F.*	°*F.*	°*F.*	%	*In.*	*In.*		*Mi.*								*0–10*	*In.*	*In.*	
Panama Canal																															
Balboa Heights	118	6	92	[1]	[2] 1,010.2	.0	82.8	+1.2	95	12	92	70	1	74	23	[3]76		3.59	+.7	6	8.5	nw.	24	n.	2	5	21	4	5.5	.0	.0	2
Cristobal	27	47	97	[1]	[2] 1,011.2	+.4	81.6	−.2	89	12	85	74	28	78	10	74	[3]78	8.93	+4.8	11	12.3	ne.	26	ne.	7	7	9	14	6.2	.0	.0	4
Alaska																															
Anchorage [4]	132	6	44	1,004.4	1,009.5		31.9	−3.5	56	30	42	−21	2	22	38	20	62	.23	−.2	5	5.5	n.	20	s.	22	7	9	14	6.5	1.4	.0	0
Fairbanks [4]	455	4	63	993.9	1,011.5		25.0	−4.4	57	28	40	−32	3	10	56	14	64	.01	−.3	1	5.1	n.	29	w.	14	11	8	11	5.4	.2	T	0
Juneau [4]	80	6	21	1,008.1	1,011.2		39.6		58	20	47	8	4	32	30	34	79	3.65		16	7.6	e.	37	e.	21	1	3	26	8.7	15.1	.0	0
Nome	22	25	56	1,009.8	1,010.5		16.4	−3.2	41	28	26	−21	2	6	30	12	78	.87	+.2	8	6.8	ne.	23	e.	3	12	9	9	4.9	7.7	11.5	0
Hawaiian Islands																															
Honolulu	38	86	100	1,018.3	1,019.0		74.8	+1.8	80	14	79	67	4	71	11			.46	−1.6	9	11.3	e.	25	ne.	21	18	8	4	3.8	.0	.0	0
Alaska																															
Bethel	28	7	31	1,006.8	1,008.1		25.8	−1.8	50	29	35	−11	1	16	34	21	77	.60	.0	9	9.6	ne.	28		18	11	7	12	5.7	8.8	T	0
Gambell	32	5	32	1,010.5	1,011.5		11.3	−7.2	37	25	18	−11	1	5	29	10	87	.83	−.1	9	13.4	ne.	42	nne.	6	9	8	13	5.8	8.3	15.4	0
Ketchikan	75	69	90	1,010.5	1,011.2		44.0	+1.4	58	13	50	30	1	38	25	38	80	10.16	−.9	20	6.6	se.	26	s.	21	1	6	23	8.7	T	.0	0
Kotzebue	20	5	31	1,011.9	1,012.2		6.6	−7.4	32	28	18	−25	3	−4	34	6	87	.30	.0	6		ne.				12	6	12	5.0	4.2	13.6	0
McGrath	331	5	31	997.3	1,010.2		23.6		54	30	39	−28	1	8	44	14	64	.10	−.3	2		nw.				16	5	9	4.4	3.4	13.0	0
Northway	1,718	5	32	946.8			24.5		57	29	39	−42	1	10	48	14	64	.28		3	5.2	nw.	28			14	8	12	10	5.7	2.0	.0	0
Summit	2,405	5	30	922.5	1,011.5		18.6		47	29	30	−30	1	7	34	12	70	.06		4		ne.	30	ese.	14	9	11	10	6.0	1.0	20.4	0

[1] Data are airport records.

[2] Barometric data (adjusted to old city elevation) and hygrometric data from airport; otherwise city office records.

[3] Observations taken bihourly.

[4] Pressure (adjusted to old city elevation) temperature and hygrometric data from airport; otherwise city office records.

[5] Temperature and precipitation from city office records, other data from airport.

NOTE.—Except as indicated by notes 1, 2, 4, and 5 data in table are city office records

SEVERE LOCAL STORMS, APRIL 1944

[Compiled by Mary O. Souder]

[The table herewith contains such data as has been received concerning severe local storms that occurred during the month. A revised list of tornadoes will appear in the United States Meteorological Yearbook]

Place	Date	Time	Width of path, yards	Loss of life	Value of property destroyed	Character of storm	Remarks
	April						
Henrietta, Tex.	1	8 p. m.	[1] 1		$1,500	Hail	Loss in crops, $500; property damage, $1,000; path 6 miles long.
Bridgeport, Tex.	2	10 p. m.	[1] 4		5,000	Hail and wind	Property damaged; path 5 miles long.
San Antonio, Tex.	2	11:15 p. m.	[1] 3		1,005,000	Hail	Property damaged, $1,000,000; loss in growing crops, $5,000; path 10 miles long.
Madison and St. Lucie Counties, Fla.	2				1,000	do	Loss in young cotton and corn in Madison County; in Saint Le. County loss over a small area was estimated to be from 5 to 25 percent to tomatoes, beans, and citrus.
Waveland, Ind.	7					Electrical	Barn burned, loss several thousands of dollars.
Hamilton County, Tex.	8	6 p. m.	[1] 10		325,000	Straight-line-wind and hail.	Property damaged, $250,000; loss in crops, $75,000; path 25 miles long.
McPherson County, Kans.	8	do	[1] 15		25,000	Hail	Property damaged; path 30 miles long.
Pottsville, Tex.	8	do	[1] 2½	1	1,000,000	Tornado	Property damaged; 7 persons injured; path 10 miles long
Graham, Tex.	8	7:30 p. m.	[1] 6			Hail	Loss in gsowing wheat and property damage not estimated; path 10 miles long.
Kingfisher County, Okla.	8	9 p. m.			10,000	Wind	Propperty damaged.
Tillman County, Okla.	8		440		4,000	do	2 persons injured; property damaged, $1,000 loss in crops, $3,000; path 1 mile long.
Beaver County, Okla.	9	6:30 p. m.	75	0	2,250	Tornado	Buildings damaged on 4 farmsteads; path 25 miles long.
Kiowa County, Okla.	9	do	220	0	50,000	do	3 persons injured; 11 city homes damaged. 3 farmhouses partially destroyed, 1 farmhouse carried 440 yards. Cotton oil mill and 3 business houses destroyed; path 5 miles long.
Washita County, Okla.	9	do	[1] 3	1	500,000	Tornado and hail	At least 3 distinct storms running side by side; 10 persons injured; 75 homes and many barns destroyed; path 14 miles long.
Seward County, Kans.	9	6:45 p. m.	220	0	170,000	Tornado	Storm originated near Turpin, Okla. Chief damage to Army Airfield short distance west of Liberal where several warehouses were wrecked. Path 20 miles long.
Lincoln County, Okla.	9	7 p. m.		0		do	House and barn destroyed; property damaged.
Custer County, Okla.	9		[1] 1	0	6,000	do	Many homes damaged; 4 persons injured; path 45 miles long.
Indianapolis, Ind.	9			0	5,000	do	A dozen or more houses and garages damaged.
Creek, Okla.	10	2 a. m.	880	4	8,500	do	Property damaged, $8,000; loss in orchards, $500 ;path 10 miles long.
Caddo County, Okla.	10	3 a. m.			5,500	Hail and wind	Property damaged.
Nowata and Craig Counties, Okla.	10	do	[1] 15		22,000	Tornadic winds	1 person injured; property damaged, $20,000; loss in crops $12,000; path 20 miles long.
Labette County, Kans.	10	3-3:30 a. m.	[1] 15	0	75,000	Tornado and hail	Storm originated near Nowata, Okla, and extended to St. Paul, Kans., passing a short distance south of Parsons. Damage in business sections of Altamont and Edna and to 150 farmsteads. Heavy hail fell in Mount Valley and Parsons, Kans., path 65 miles long.
Craig, Okla.	10	2:30 p. m.	[1] 3½	0	1,500	Tornado	Small farm buildings damaged; path 16 miles long.

[1] Miles instead of yards.

SEVERE LOCAL STORMS, APRIL 1944—Continued

Place	Date	Time	Width of path, yards	Loss of life	Value of property destroyed	Character of storm	Remarks
	April						
Reno County, Tex.	10	4 p. m.	100	0	1,100	do	Originated 6 miles west of Hutchinson; loss in poultry; path 2 miles long.
Harvey County, Kans.	10	4:15 p. m.	17	0	500	do	Originated 5 miles west of Newton; 2 barns damaged; path broken and 2 miles long.
Columbia to Cross Counties, Ark.	10	6:30 p. m.-12 p. m.	17-200	42	550,700	Tornadoes	304 persons injured; over 600 homes and 1,000 building destroyed or damaged. The storm moved almost directly northeastward, dipping to earth at intervals of 15 to 30 miles, with rotary winds and property destruction near the center of the path almost complete.
Boone and Montgomery Counties, Ark.	10			1	35,000	Tornado	16 persons injured; many trees uprooted in the Ouachita National forest in Montgomery County.
Marshall, Ind.	10				3,000	Electrical	A barn with 3 horses and 10 cows and considerable produce burned.
Salamonia, Ind.	10				1,000	Wind	Outbuildings blown over.
Fort Wayne, Ind.	11			6		Squall	Wall of a burned building blown over killing 6 and injuring 4 persons.
Rock, Walworth, and Jefferson Counties, and Milwaukee, Wis.	11				11,000	Wind	Trees razed; utility lines down, barn wrecked and several silos and small farm buildings blown over. Greatest damage in Beloit where the storm struck shortly after 4 a. m. lasting for about half an hour, with estimated loss of $10,000. The same storm reached greatest intensity in Milwaukee at 6:42 a. m., causing minor damage estimated at $1,000.
Walhalla, S. C., vicinity of.	11			1	12,000	Tornado	Some buildings destroyed; many trees and power lines down.
Cleburne, Independence, Randolph, and Shark Counties, Ark.	14			1	120,000	Tornadoes	11 persons injured; property damaged.
Evansville, Ind.	14			0		Tornado	Property damaged.
Anderson, Abbeville, Greenwood, and Newberry Counties, S. C.	16	1-2 p. m.		18	250,000	Tornadoes	Many persons injured; property damaged; path 86 miles long.
Wills Point, Tex.	19	9 p. m.	[1] 1		1,500	Wind and hail	Property damaged; path 2 miles long.
Albany, Tex., vicinity of.	21	7 p. m.	[1] 1		1,500	Hail	Property in oil field damaged; path 3 miles long.
Eastland, Tex.	21	7 p. m.				do	Severe loss in crops and property damage not estimated.
Jefferson and Henry Counties, Iowa.	21			0	17,250	Tornado	Property damage.
Allen and Anderson Counties, Kans.	22	5:30-5:45 p. m.	[1] 3		12,000	Heavy hail and wind	Most of damage from wind that reached tornadic violence in some parts of the path which was 32 miles long.
Madison County, Fla.	22				1,000	Hail	Loss in tobacco crop.
Greely, Scott, Wichita and Stanton Counties, Kans.	22-23	p. m.			200,000	Heavy, clinging snow and high wind.	Loss extended from Scott City to Tribune, Kans. Much damage to power and telephone lines in Stanton County.
Indianapolis, Ind.	23	p. m.			6,000	Electrical	Windows blown out; trees and wires down; house burned.
Kokomo, Ind.	23	do				Wind	Several houses unroofed; garage destroyed; chimneys toppled.
Oklahoma County, Okla.	23					do	8 oil derricks damaged.
South Hill, Va., 6 miles northwest.	24	7 p. m.	100	3	5,000	Tornado	Damage limited to several homes.
Hammond, Ind.	24			0		Small tornado	Slight damage in Hammond, Ind. The storm then moved northeastward into Lake Michigan.
Beckman County, Okla.	25	6:30 p. m.				Hail	Some replanting of corn necessary over small areas; considerable property damage.
Edisto Island, S. C.	27	3 a. m.	165	0	2,000	Tornado	Damage to buildings.
Protection, Kans., vicinity of.	29	8:15 p. m.	440	0	10,000	do	Storm moved south-southwest with damage to rural property; path 9 miles long.
Clark and Comanche Counties, Kans.	29	8:30 p. m.	[1] 1	0	40,000	do	Originated about 15 miles northeast of Ashland, Kans. Damage to rural property; buildings demolished and poultry and livestock killed; path 6 miles long.
Pratt County, Kans.	29	10:45 p. m.	110	0	15,000	do	Originated in the vicinity of Croft and ended near Pratt, Kans. Damage to farm property; path 20 miles long.
Hondo, Tex.	30	2 a. m.	[1] 1		3,000	Hail	Loss in oats and corn; small property damage; path 3 miles long.
Grant County, Wis.	30	3-4 p. m.			2,000	Wind	Trees uprooted; utility poles and wires down; barn moved off its foundation; small farm buildings unroofed.
Craig County, Okla.	30	6-6:30 p. m.	[1] 11	0	14,000	Tornado and hail	Loss in crops, $10,000; property damage, $4,000; path 20 miles long.

[1] Miles instead of yards.

SOLAR RADIATION AND SUNSPOT DATA FOR APRIL 1944

[Solar Radiation Investigations Section, I. F. Hand in charge]

SOLAR RADIATION OBSERVATIONS FOR MARCH AND APRIL 1944

EXPLANATIONS of the tables and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, and also a list of pyrheliometric stations are given in the REVIEW for January 1944, page 43.

TABLE 1.—*Solar radiation intensities during March 1944*

[Gram-calories per minute per square centimeter of normal surface]

Madison, Wis.

Date	Sun's zenith distance: 7:30 a. m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	1:30 p. m.
	75th mer. time	Air mass: A. M.				P. M.					Local mean solar time
	e.	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0	e.
1944	*mb.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mb.*
Mar. 9	1.08	0.92	1.06	1.19	1.37	1.48	1.34	1.19	.....	.....	1.73
Mar. 20	2.34	.83	0.98	1.11	1.18	1.37	.....	.....	.....	.....	3.49
Mar. 21	3.83	.59	.74	.90	1.11	.....	.....	.....	.....	.....	5.08
Mar. 24	6.10	.....	.....	.88	1.11	.....	.....	.....	.....	.....	8.40
Mar. 31	3.15	.79	.86	1.04	1.22	1.51	.....	.....	.....	.....	4.20
Means	.....	.78	.91	1.02	1.20	1.45	(1.34)	(1.19)	.....	.....	.....
Departures	.....	−.06	−.07	−.10	−.09	−.09	+.05	+.02	.....	.....	.....

Lincoln, Nebr.

Mar. 6	2.13	.....	0.89	1.07	1.29	1.49	1.33	1.18	1.05	0.96	2.47
Mar. 7	2.23	.....	.....	.....	1.34	.....	.....	.....	.....	.....	2.34
Mar. 8	1.15	.....	.....	.....	.....	1.51	1.29	1.11	.....	.....	2.03
Mar. 16	4.40	0.72	.83	.98	1.18	1.42	.....	.....	.....	.....	4.84
Mar. 23	4.03	.83	.83	1.03	1.22	1.46	1.24	1.09	.96	.85	6.91
Mar. 24	6.10	.90	1.01	1.14	.....	.....	.....	.....	.....	.....	6.63
Mar. 24	3.49	.....	.....	.....	.....	.....	1.16	.....	.....	.....	4.64
Mar. 29	2.13	.....	.....	1.07	1.22	1.45	.....	.....	.....	.....	2.61
Mar. 30	2.34	.....	.89	1.04	1.24	1.57	.....	.....	.....	.....	2.13
Means	.....	.82	.89	1.06	1.25	1.48	1.26	1.13	(1.01)	(.91)	.....
Departures	.....	−.02	−.05	−.03	−.03	−.06	−.01	+.04	+.07	+.09	.....

Albuquerque, New Mex. 7:30 p. m

Mar. 6	2.88	.....	1.19	1.34	.....	1.64	.....	.....	.....	.....	3.01
Mar. 8	2.37	1.20	1.34	1.46	1.58	.....	1.50	.....	.....	.....	2.27
Mar. 9	4.60	1.19	1.29	1.41	1.54	1.69	1.47	.....	.....	.....	3.49
Mar. 10	5.08	.....	.....	.....	.....	.....	1.42	.....	.....	.....	5.56

*Extrapolated.

TABLE 1.—*Solar radiation intensities during March 1944*—Continued

Albuquerque, New Mex.—Continued

Date	Sun's zenith distance: 7:30 a. m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.0°	75.0°	78.7°	1:30 p. m.
	75th mer. time	Air mass: A. M.				P. M.					Local mean solar time
	e.	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0	e.
	mb.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mb.*
Mar. 11	5.08	.....	.....	.....	1.50	.....	.....	.....	.....	.....	6.09
Means	.....	(1.20)	1.27	1.40	1.54	(1.66)	1.46	.....	.....	.....	.....
Departures	.....	+.16	+.12	+.13	+.13	+.05	+.05	.....	.....	.....	.....

Albuquerque, New Mex.

Apr. 5	3.65	.....	.....	.....	.....	.....	1.46	1.39	.....	.....	4.20
Apr. 11	7.72	.....	.....	.....	1.21	.....	.....	.....	.....	.....	8.67
Apr. 12	7.41	.....	.....	.....	1.31	.....	.....	.....	.....	.....	5.08
Apr. 15	2.73	.....	.....	.....	1.33	.....	.....	.....	.....	.....	3.65
Apr. 16	4.60	.....	.....	.....	1.22	.....	.....	.....	.....	.....	3.32
Apr. 17	3.83	.....	.....	.....	1.30	.....	1.30	.....	.....	.....	3.01
Apr. 18	4.20	.....	.....	.....	1.26	.....	.....	.....	.....	.....	3.49
Apr. 19	6.09	.....	.....	.....	1.28	.....	.....	.....	.....	.....	4.60
Apr. 23	4.40	.....	.....	.....	1.32	1.43	.....	.....	.....	.....	3.49
Apr. 26	6.09	.....	.....	.....	1.29	1.39	.....	.....	.....	.....	4.60
Apr. 27	6.88	.....	.....	.....	1.20	.....	.....	.....	.....	.....	7.41
Means	.....	.....	.....	.....	1.27	1.43	(1.34)	.....	.....	.....	.....
Departures	.....	.....	.....	1.29	−.01	+.01	+.03	.....	.....	.....	.....

Madison, Wis.

Apr. 3	3.32	0.90	0.98	1.10	1.25	.....	.....	.....	.....	.....	3.32
Apr. 5	3.66	.75	.87	1.01	1.19	1.48	1.25	.....	.....	.....	3.66
Apr. 6	4.40	.80	.92	.96	1.16	1.42	1.03	0.90	.....	.....	5.08
Apr. 12	4.03	.....	.....	.....	.....	1.45	1.16	.....	.....	.....	3.49
Apr. 13	4.84	.....	.....	.....	.98	1.26	.....	.....	.....	.....	4.84
Apr. 17	4.84	.....	.65	.71	.83	.....	.....	.....	.....	.....	5.32
Apr. 19	5.32	.54	.68	.77	.88	1.36	.....	.....	.....	.....	5.82
Apr. 27	6.37	.65	.76	.88	1.04	1.42	1.07	.....	.....	.....	9.41
Apr. 28	5.82	.62	.74	.88	1.06	1.41	.....	.....	.....	.....	5.08
Apr. 29	5.59	.54	.69	.84	.95	.....	.....	.....	.....	.....	6.37
Means	.....	.69	.79	.89	1.04	1.42	1.13	(.90)	.....	.....	.....
Departures	.....	−.05	−.09	−.14	−.15	.00	−.05	−.16	.....	.....	.....

Lincoln, Nebr.

Apr. 4	3.66	.....	.....	.....	.....	1.47	1.29	1.09	0.98	0.88	3.32
Apr. 5	3.02	.....	.....	0.96	1.24	1.51	1.27	1.14	.98	.88	3.66
Apr. 12	4.64	.....	.....	.94	1.09	1.30	.....	.....	.....	.....	7.18
Apr. 24	6.63	.....	.....	.....	.....	.....	1.03	.80	.64	.56	7.18
Means	.....	.....	.....	(.95)	(1.16)	1.43	1.20	1.01	.87	.77	.....
Departures	.....	.....	.....	−.03	−.03	−.03	+.02	+.05	+.05	−.07	.....

*Extrapolated.

TABLE 2.—*Daily totals and weekly means of solar radiation (direct+diffuse) received on a horizontal surface*

[Gram-calories per square centimeter]

Date	Washington, D. C.	Madison, Wis.	Lincoln, Nebr.	East Lansing, Mich.	New York, N. Y.	Fresno, Calif.	Columbia, Mo.	Boston, Mass.	Nashville, Tenn.	Twin Falls, Idaho	La Jolla, Calif.	New Orleans, La.	Riverside, Calif.	Blue Hill, Mass.	Ithaca, N. Y.	Newport, R. I.	State College, Pa.	Put-in-Bay, Ohio	East Wareham, Mass.	Davis, Calif.
1944	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
Feb. 26	26	119	201	228	56	246	235	241	218	334	182	302	130	295	.....	240	37	285	328	459
Feb. 27	140	171	136	54	36	430	204	53	337	325	459	329	451	94	.....	95	177	75	96	393
Feb. 28	288	125	243	51	251	236	58	32	14	106	436	245	404	74	.....	129	82	74	67	55
Feb. 29	55	185	370	205	36	258	451	48	75	218	456	475	432	80	.....	129	129	171	87	331
Mar. 1	454	333	192	369	417	338	462	375	213	337	433	517	228	436	216	422	434	364	415	329
Mar. 2	462	128	53	109	346	311	140	366	441	403	418	510	108	469	449	445	382	365	453	413
Mar. 3	382	91	12	23	92	278	86	151	211	404	368	370	230	250	100	208	276	38	230	101
Mean	**258**	**165**	**172**	**148**	**176**	**300**	**234**	**181**	**216**	**304**	**393**	**393**	**283**	**242**	.....	**238**	**217**	**196**	**240**	**297**
Departure	**−23**	**−104**	**−135**	**−80**	**−86**	**−53**	.....	.....	**−38**	**+17**	**−6**	**+113**	**−69**	**−51**	.....	**−50**	**−17**	**−44**	**−48**	**+1**
Mar. 4	40	97	251	141	78	127	61	301	343	249	424	231	239	391	284	332	51	41	355	113
Mar. 5	208	216	58	221	374	492	136	354	142	227	485	168	350	460	481	409	435	457	452	486
Mar. 6	177	92	489	48	307	461	360	282	29	418	485	.....	487	449	361	441	156	73	451	369
Mar. 7	99	295	462	201	45	471	335	10	480	438	488	635	480	30	154	42	298	352	38	421
Mar. 8	310	448	472	284	302	444	506	253	346	392	510	.....	520	308	341	372	261	236	409	489
Mar. 9	462	496	277	264	350	449	493	301	444	152	508	.....	501	358	256	318	341	353	347	421
Mar. 10	459	346	437	306	361	364	460	354	480	197	488	151	496	412	328	410	348	434	439	475
Mean	**265**	**284**	**350**	**209**	**260**	**401**	**336**	**265**	**324**	**296**	**484**	**296**	**439**	**344**	**314**	**332**	**270**	**278**	**356**	**396**
Departure	**−47**	**−14**	**+24**	**−19**	**−15**	**+6**	.....	.....	**+46**	**−49**	**+63**	**−30**	**+35**	**+47**	**+54**	**+30**	**+8**	**+37**	**+76**	**+44**
Mar. 11	401	223	102	314	210	407	199	291	296	451	257	172	373	417	146	436	371	432	431	380
Mar. 12	76	330	479	221	309	384	522	331	125	254	220	498	192	409	208	423	62	113	423	320
Mar. 13	488	135	40	350	300	272	154	18	480	348	117	450	150	41	190	20	478	203	46	533
Mar. 14	488	58	33	38	469	517	353	426	487	384	446	568	315	483	272	498	366	92	497	546
Mar. 15	440	73	36	25	165	528	114	125	445	489	285	496	454	130	.....	107	365	105	141	502
Mar. 16	356	83	408	48	127	500	103	36	166	350	504	163	530	76	.....	84	94	53	69	481
Mar. 17	172	243	96	80	49	456	316	88	491	473	511	441	507	116	.....	125	94	84	120	499
Mean	**346**	**164**	**170**	**154**	**233**	**438**	**252**	**188**	**356**	**393**	**336**	**400**	**360**	**239**	**204**	**242**	**262**	**154**	**247**	**466**
Departure	**+28**	**−149**	**−174**	**−96**	**−46**	**+31**	.....	.....	**+50**	**+59**	**−61**	**+50**	**−31**	**−52**	**−21**	**−51**	**−19**	**−117**	**−36**	**+40**
Mar. 18	232	476	359	320	228	530	58	269	76	485	394	140	516	282	.....	335	164	297	338	564
Mar. 19	93	446	491	186	284	537	118	358	56	296	168	126	125	383	.....	402	200	156	401	565
Mar. 20	61	505	413	449	56	563	499	130	55	469	500	182	526	152	.....	151	129	334	146	578
Mar. 21	508	420	55	432	396	551	283	335	337	526	550	421	564	449	.....	535	404	491	498	564
Mar. 22	471	106	124	196	400	533	246	461	270	446	545	66	550	525	.....	545	420	273	524	551
Mar. 23	80	324	488	87	55	518	536	55	212	231	547	193	509	141	.....	153	116	176	145	522
Mar. 24	559	421	293	418	490	547	459	467	538	340	514	649	486	474	.....	517	525	505	506	534
Mean	**286**	**385**	**318**	**298**	**273**	**540**	**314**	**296**	**220**	**399**	**460**	**254**	**468**	**344**	.....	**377**	**280**	**319**	**365**	**554**
Departure	**−56**	**+52**	**−60**	**+2**	**−69**	**+85**	.....	.....	**−116**	**−3**	**+11**	**−102**	**+70**	**−36**	.....	**−38**	**+13**	**−9**	**+43**	**+56**
Mar. 25	508	470	483	78	435	584	189	438	532	312	384	672	507	510	.....	510	497	289	534	596
Mar. 26	534	132	69	302	507	558	25	422	527	266	555	249	.....	480	.....	512	559	391	503	578
Mar. 27	156	326	343	92	78	568	481	146	160	560	552	367	.....	212	93	215	157	110	236	612
Mar. 28	330	354	149	420	430	585	215	378	83	565	564	260	.....	455	342	475	414	441	516	596
Mar. 29	54	354	457	38	106	568	442	350	98	540	582	106	.....	394	67	330	33	54	389	534
Mar. 30	312	319	541	260	62	572	409	44	560	380	585	.....	.....	72	304	79	486	348	69	528
Mar. 31	480	524	421	396	397	555	480	451	538	505	547	650	.....	478	292	445	333	350	488	582
Mean	**339**	**354**	**352**	**226**	**288**	**570**	**320**	**318**	**357**	**447**	**539**	**384**	.....	**373**	**220**	**367**	**354**	**279**	**391**	**575**
Departure	**−11**	**+2**	**−21**	**−119**	**−37**	**+101**	.....	.....	**−20**	**+74**	**+47**	**+18**	.....	**−8**	**−65**	**+2**	**+1**	**−93**	**+25**	**+42**
ACCUMULATED DEPARTURES ON MAR. 31, 1944																				
	−938	**−1344**	**−1442**	**−3689**	**−1533**	**+2863**	.....	.....	**−553**	**+1029**	**−28**	.....	.....	**−7**	.....	**−798**	**+1834**	**−1267**	**+791**	**+1323**

TABLE 2.—*Daily totals and weekly means of solar radiation (direct+diffuse) received on a horizontal surface*

[Gram-calories per square centimeter]

1944	Washington, D. C.	Madison, Wis.	Lincoln, Nebr.	East Lansing, Mich.	New York, N. Y.	Fresno, Calif.	Columbia, Mo.	Boston, Mass.	Nashville, Tenn.	Twin Falls, Idaho	La Jolla, Calif.	New Orleans, La.	Blue Hill, Mass.	Ithaca, N. Y.	Newport, R. I.	State College, Pa.	Put-in-Bay, Ohio	East Wareham, Mass.	Davis, Calif.
	cal.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
Apr. 1	299	434	356	203	337	561	534	508	584	534	488	556	555	136	546	114	338	329	580
Apr. 2	264	425	264	228	140	551	612	237	49	555	252	182	301	427	346	330	452	.....	557
Apr. 3	434	462	487	245	530	340	562	470	601	500	378	.....	574	343	514	576	347	.....	329
Apr. 4	172	258	567	304	199	413	614	280	495	339	531	701	432	384	526	232	447	506	370
Apr. 5	420	596	566	145	67	615	615	264	575	316	574	527	302	280	243	407	279	235	628
Apr. 6	416	559	239	506	530	606	430	506	562	501	605	497	580	321	568	311	575	526	560
Apr. 7	458	425	339	125	428	606	488	487	133	551	532	491	538	493	437	403	92	528	498
Mean	352	451	402	250	319	528	551	393	433	471	480	492	469	355	454	339	361	465	503
Departure	−21	+78	+10	−94	−30	+30	.....	.....	+32	+35	−21	+72	+70	+78	+31	−27	−22	+62	−29
Apr. 8	360	471	109	403	234	418	336	30	90	126	254	212	79	77	112	181	339	107	532
Apr. 9	474	123	153	103	205	572	340	312	327	108	583	123	369	241	336	326	90	338	664
Apr. 10	466	323	20	490	211	568	32	85	242	463	619	252	184	49	140	232	505	134	420
Apr. 11	183	86	147	56	296	250	74	385	466	93	613	181	466	120	483	60	37	481	571
Apr. 12	331	602	575	526	129	530	662	24	90	486	570	711	90	20	89	80	535	93	642
Apr. 13	641	556	420	540	608	593	624	450	639	394	484	604	526	535	467	595	637	462	284
Apr. 14	468	80	41	104	460	625	214	553	525	512	564	157	634	591	631	299	211	560	642
Mean	418	320	210	317	307	508	326	263	338	312	527	329	335	233	322	253	336	311	535
Departure	+20	−82	−214	−48	−45	−32	.....	.....	−86	−137	+8	−106	−34	−44	−87	−123	−52	−71	−5
Apr. 15	104	51	67	37	49	586	51	131	448	389	552	346	138	138	116	163	139	145	625
Apr. 16	323	554	624	248	151	675	114	41	134	117	483	660	76	61	86	256	74	94	672
Apr. 17	393	556	18	578	283	570	95	64	473	440	642	489	113	534	130	489	630	90	495
Apr. 18	265	384	131	438	624	663	108	617	582	414	616	194	656	420	602	491	424	596	593
Apr. 19	148	570	30	529	466	223	464	578	419	302	588	206	662	653	643	608	673	590	216
Apr. 20	406	40	209	154	479	567	344	610	420	120	542	198	666	493	621	473	282	612	641
Apr. 21	471	150	7	170	89	637	301	13	492	272	617	246	110	241	102	149	349	115	706
Mean	301	329	155	308	306	560	211	294	424	294	577	334	346	363	329	376	367	320	564
Departure	−110	−73	−281	−51	−78	−18	.....	.....	+18	−180	+25	−75	−29	+65	−72	−26	−15	−58	+28
Apr. 22	147	149	0	84	368	664	258	592	426	334	630	447	632	28	543	131	78	629	676
Apr. 23	48	114	16	100	64	508	366	497	220	480	451	20	554	44	377	36	126	535	388
Apr. 24	55	160	270	108	33	611	122	18	520	347	347	660	63	118	58	104	224	43	660
Apr. 25	491	161	130	81	214	677	341	225	600	664	645	215	334	39	288	144	106	378	636
Apr. 26	476	235	2	175	319	350	69	53	179	606	533	.....	142	96	277	501	483	143	164
Apr. 27	17	674	122	619	53	318	220	282	309	268	518	688	332	271	195	226	625	250	526
Apr. 28	678	684	195	615	673	399	616	622	672	332	542	645	683	693	666	716	707	534	559
Mean	272	311	105	254	246	504	284	327	413	433	524	446	391	184	343	265	335	359	520
Departure	−177	−127	−329	−96	−208	−55	.....	.....	−30	−68	−13	+26	−63	−236	−130	−184	−53	−57	−28
ACCUMULATED DEPARTURES ON APR. 28, 1944																			
	−2954	−2772	−7077	−5712	−4060	+2338	.....	.....	−805	−1421	−35	.....	−329	.....	−2604	−686	−2261	−77	+1085

POSITIONS, AREAS, AND COUNTS OF SUNSPOTS FOR APRIL 1944

[Communicated by Capt. J. F. Hellweg, U. S. N. (Ret.) Superintendent, U. S. Naval Observatory.] All measurements and spot counts were made at the Naval Observatory from plates taken at the observatories indicated. Difference in longitude is measured from the central meridian, postitive toward the west. Latitude is positive toward the north. Areas are corrected for foreshortening and expressed in millionths of Sun's hemisphere. For each day, under longitude, latitude, area of spot or group, and spot count are included assumed longitude of center of the disk, assumed latitude of center of the disk, total area of spots and groups and total spot count.

Date	Eastern standard time	Mount Wilson group No.	Heliographic				Area of spot or group	Spot count	Plate quality	Observatory
			Difference in longitude	Longitude	Latitude	Distance from center of disk				
1944	h m		°	°	°	°				
Apr. 1	10 42	.....	.....	No spots		.....	.....	.....	G	U. S. Naval
†2	10 30	.....	.....	No spots		.....	.....	.....	.....	Mt. Wilson
3	10 39	.....	.....	No spots		.....	.....	.....	F	U. S. Naval
4	15 20	.....	.....	No spots		.....	.....	.....	F	Do.
5	10 44	.....	.....	No spots		.....	.....	.....	VG	Do.
6	12 30	.....	.....	No spots		.....	.....	.....	F	Do.
7	12 3	7639	+67	196	−23	67	6	1	F	Mt. Wilson.
				(129)	(−6)	.....	6	1		
8	10 46	.....	.....	No spots		.....	.....	.....	F	U. S. Naval.
9	10 48	.....	.....	No spots		.....	.....	.....	F	Do.
10	10 36	.....	.....	No spots		.....	.....	.....	G	Do.
†11	11 17	.....	.....	No spots		.....	.....	.....	.....	Mt. Wilson.
12	13 36	.....	.....	No spots		.....	.....	.....	G	U. S. Naval.
13	10 41	.....	.....	No spots		.....	.....	.....	F	Do.
14	12 4	.....	.....	No spots		.....	.....	.....	F	Do.
†15	10 27	.....	.....	No spots		.....	.....	.....	.....	Mt. Wilson.
16	10 25	7640	−10	1	−13	12	24	3	F	Do.
				(11)	(−5)		24	3		
17	10 30	7640	+3	1	−13	7	16	3	G	Do.
				(358)	(−5)		16	3		
†18	10 55	.....	.....	No spots		.....	.....	.....	.....	Do.
†19	10 38	.....	.....	No spots		.....	.....	.....	.....	Do.
20	11 18	.....	.....	No spots		.....	.....	.....	VG	U. S. Naval.
21	11 15	.....	.....	No spots		.....	.....	.....	G	Do.
†22	10 15	.....	.....	No spots		.....	.....	.....	.....	Mt. Wilson.
†23	19 25	.....	.....	No spots		.....	.....	.....	.....	Do.
1944	h m		°	°	°	°				
Apr. †24	11 0	.....	.....	No spots		.....	.....	.....	.....	Mt. Wilson.
25	10 18	.....	.....	No spots		.....	.....	.....	VG	U. S. Naval.
27	10 45	.....	.....	No spots		.....	.....	.....	G	Do.
28	10 54	.....	.....	No spots		.....	.....	.....	G	Do.
29	12 23	.....	.....	No spots		.....	.....	.....	F	Do.
30	10 40	.....	.....	No spots		.....	.....	.....	F	Do.

Mean daily area for 29 days=2

†Data taken from Mount Wilson charts.
VG=very good; G=good; F=fair; P=poor.

PROVISIONAL RELATIVE SUNSPOT NUMBERS FOR MARCH 1944

[Based on observations at Zurich, Arosa, or Locarno. Data furnished through the courtesy of Prof. W. Brunner, Swiss Federal Observatory, Zurich, Switzerland]

March 1944	Relative numbers	March 1944	Relative numbers	March 1944	Relative numbers
1	8	11	0	21	*27
2	0	12	0	22	36
3	8	13	*0	23	36
4	7	14	7	24	22
5	0	15	0	25	*a* 14
6	*0	16	*Ec* 8	26	14
7	*0	17	14	27	12
8	0	18	*d* 29	28	12
9	*0	19	31	29	15
10	0	20	**a* 33	30	7
				31	*0

Mean, 31 days=11.0

*=Observed at Arosa or Locarno.
a=Passage of an average-sized group through the central meridian.
c=New formation of a group developing into a middle-sized or large center of activity: E, on the eastern part of the sun's disk; W, on the western part; M, in the central-circle zone.
d=Entrance of a large or average-sized center of activity on the east limb.

Chart I. Departure (°F.) of the Mean Temperature from the Normal, and Wind Roses for Selected Stations, April 1944

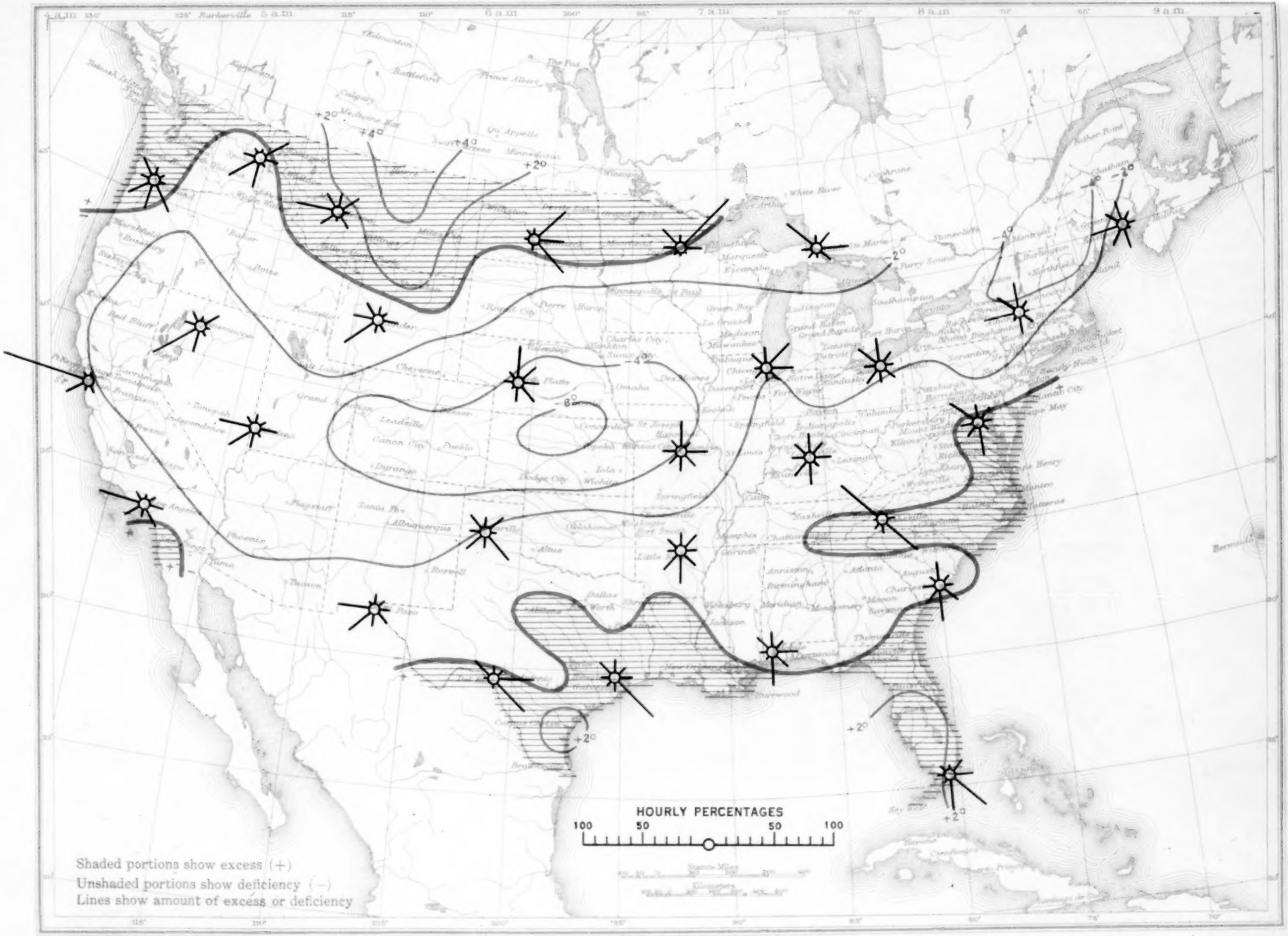
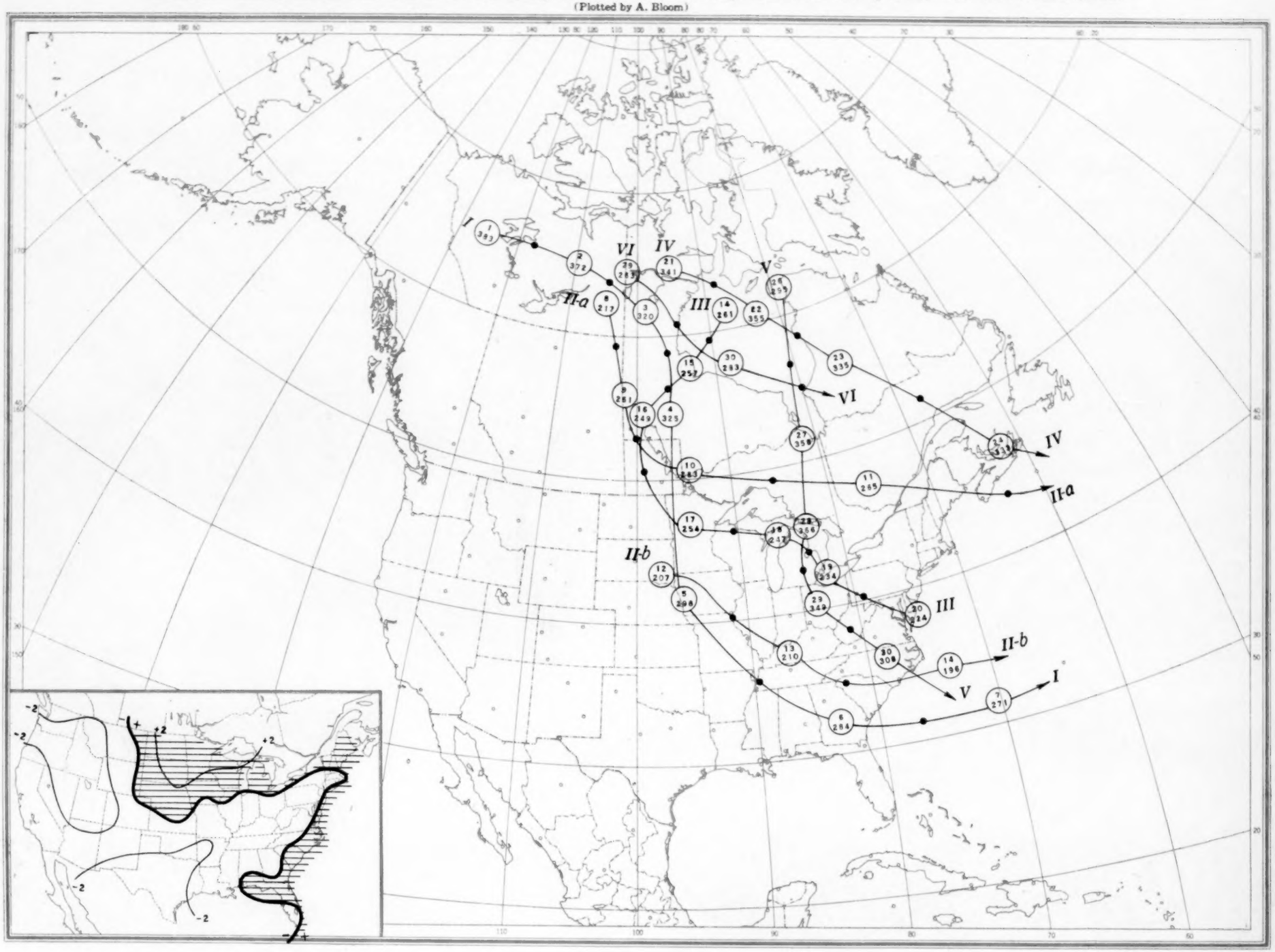


Chart II. Tracks of Centers of Anticyclones, April 1944. (Inset) Departure of Monthly Mean Pressure from Normal

(Plotted by A. Bloom)

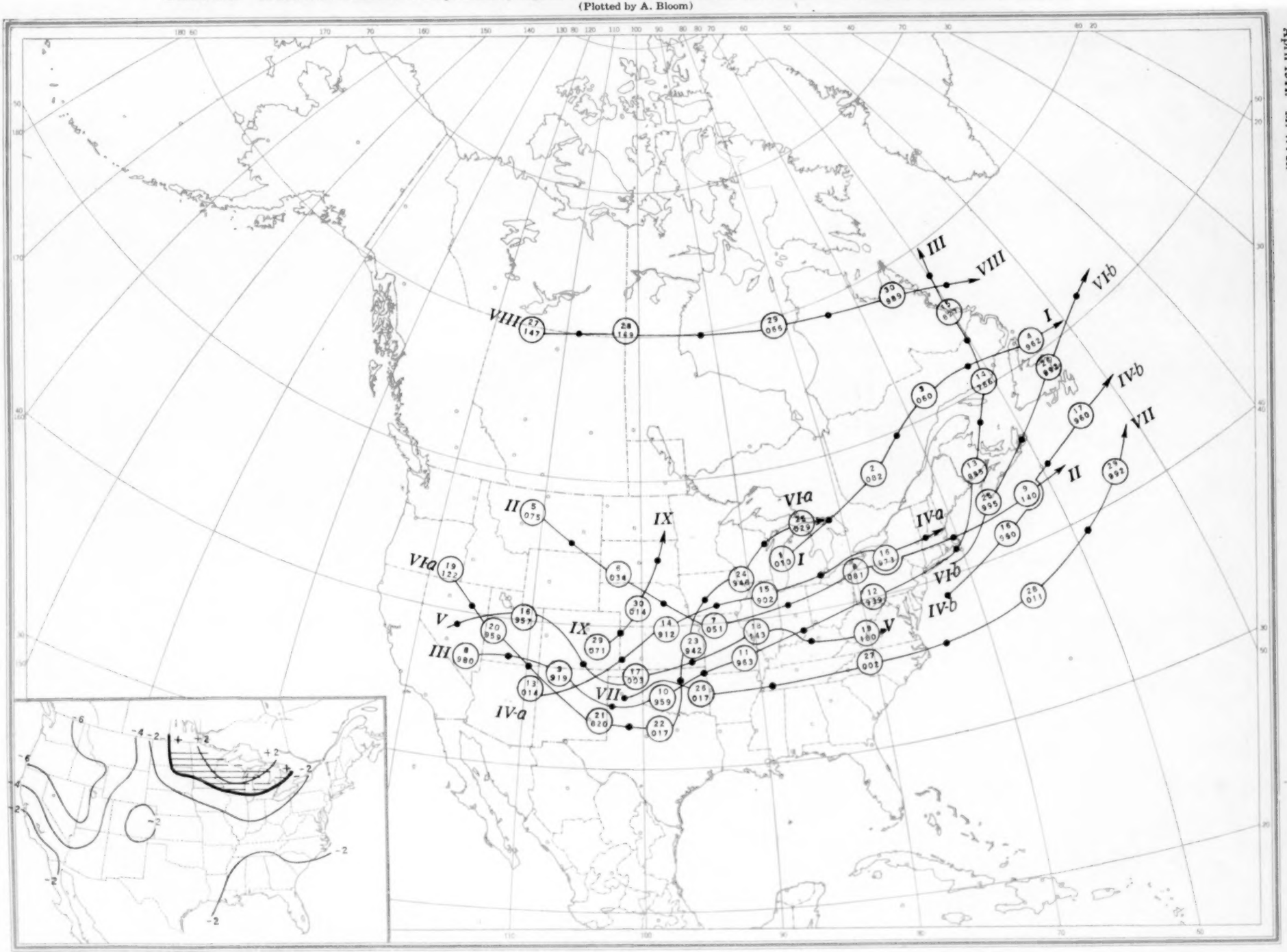


Circle indicates position of anticyclone at 7:30 a. m. (75th meridian time), with barometric reading. Dot indicates position of anticyclone at 7:30 p. m. (75th meridian time)

Circle indicates position of anticyclone at 7:30 a. m. (75th meridian time), with barometric reading. Dot indicates position of anticyclone at 7:30 p. m. (75th meridian time)

Chart III. Tracks of Centers of Cyclones, April 1944. (Inset) Change in Mean Pressure from Preceding Month

(Plotted by A. Bloom)



Circle indicates position of cyclone at 7:30 a. m. (75th meridian time), with barometric reading. Dot indicates position of cyclone at 7:30 p. m. (75th meridian time).

Chart IV. Percentage of Clear Sky Between Sunrise and Sunset, April 1944

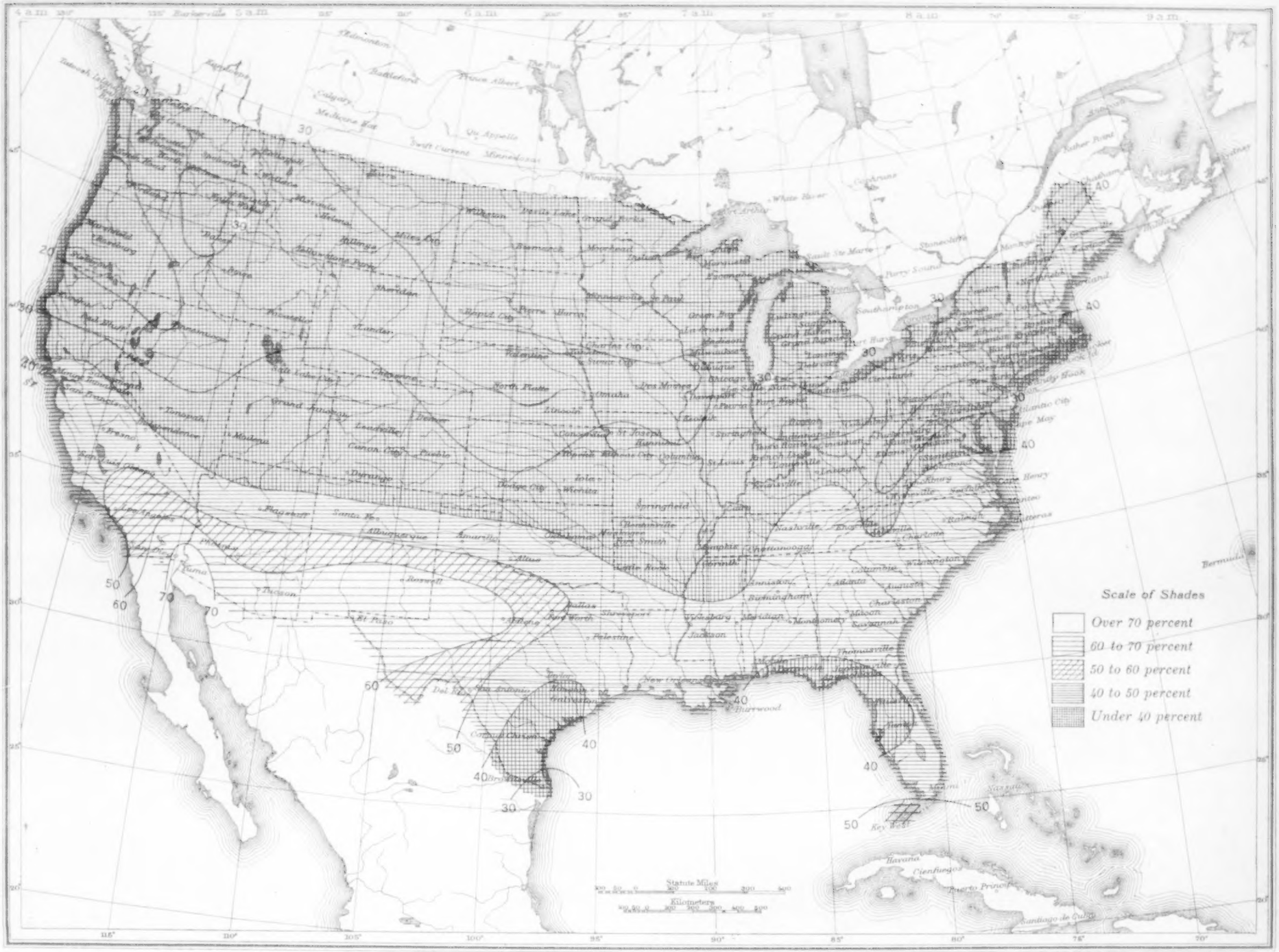


Chart V. Total Precipitation, Inches, April 1944. (Inset) Departure of Precipitation from Normal

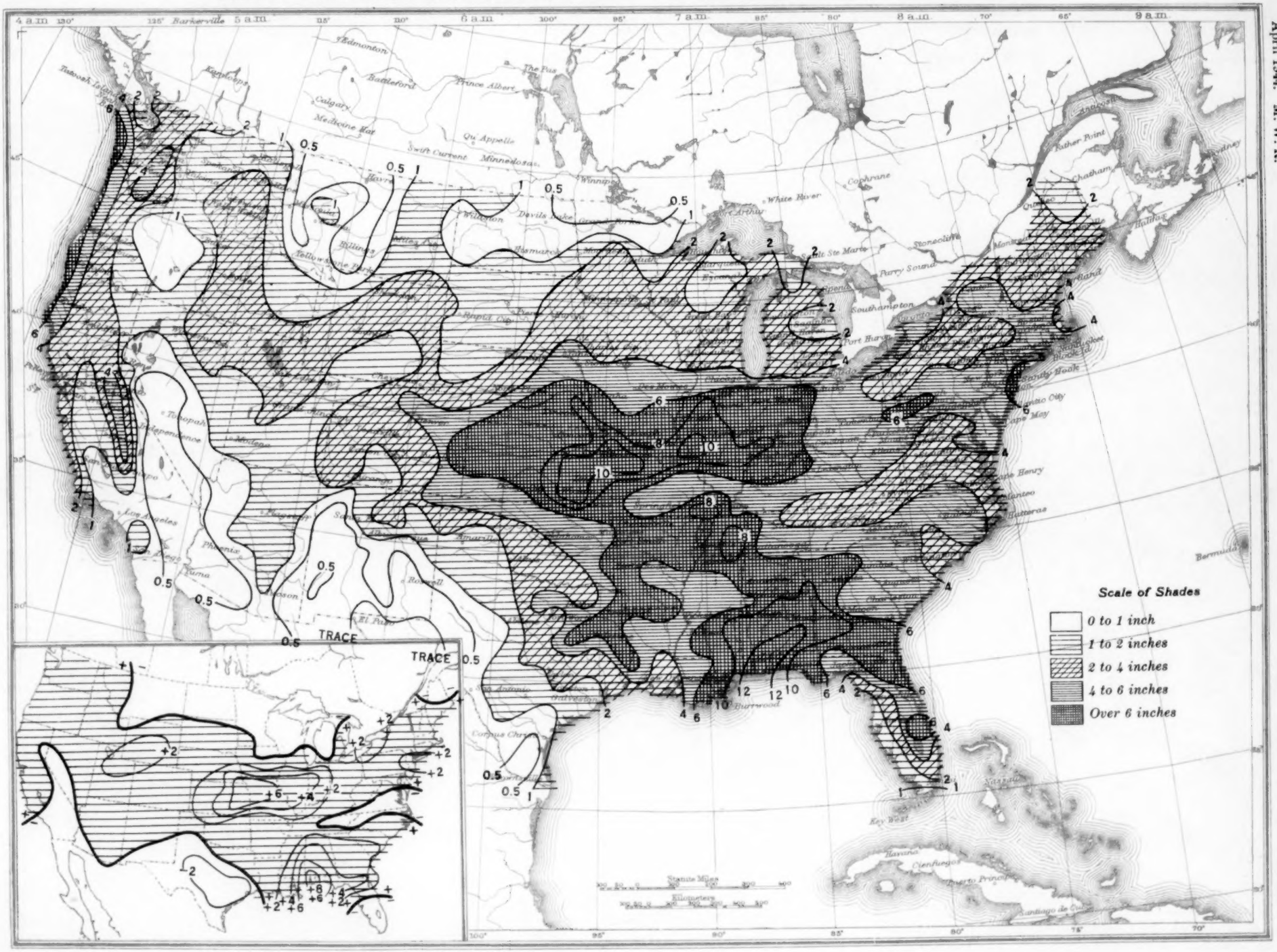


Chart VI. Isobars at Sea Level and Isotherms at Surface; Prevailing Winds, April 1944

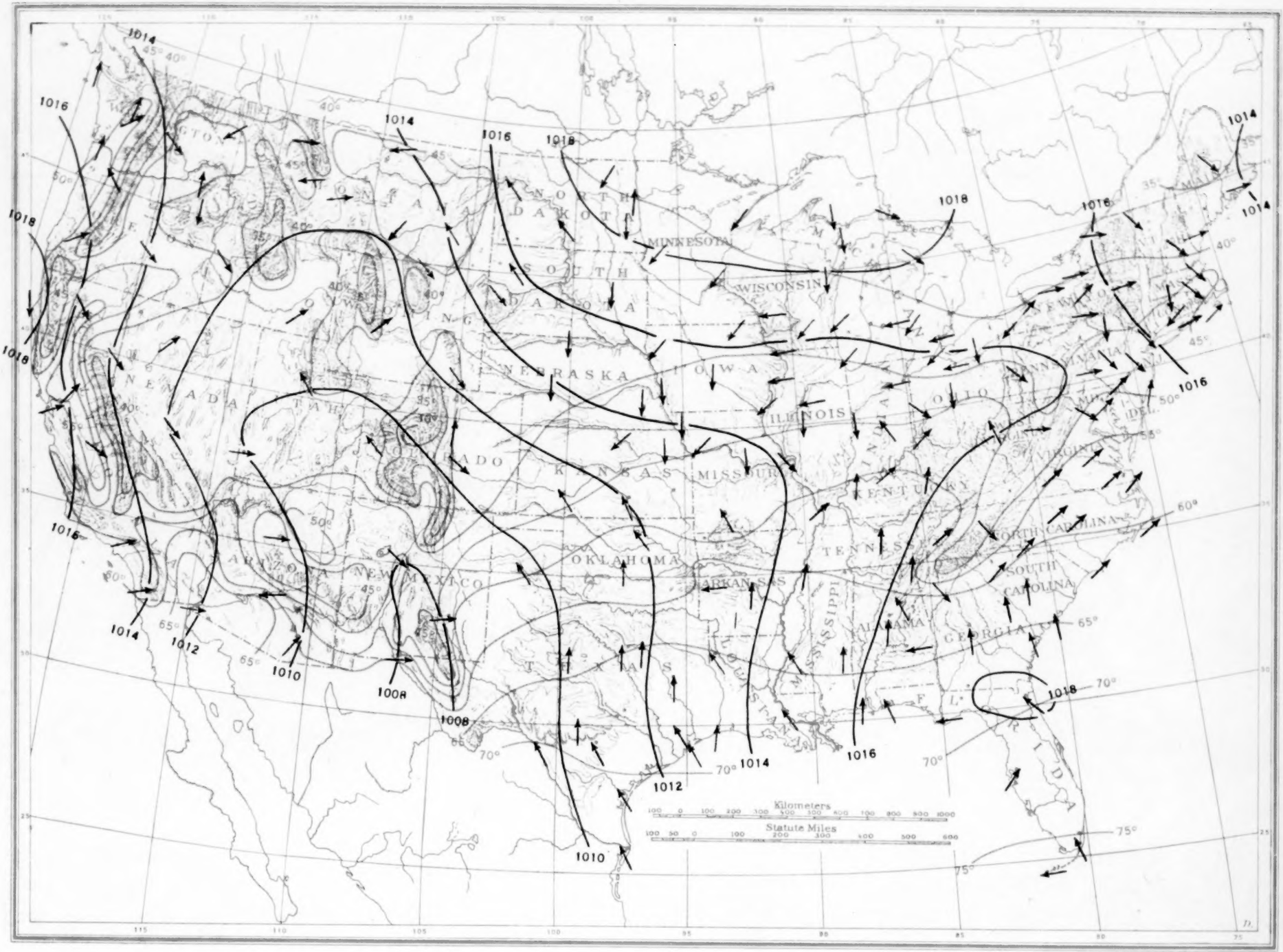
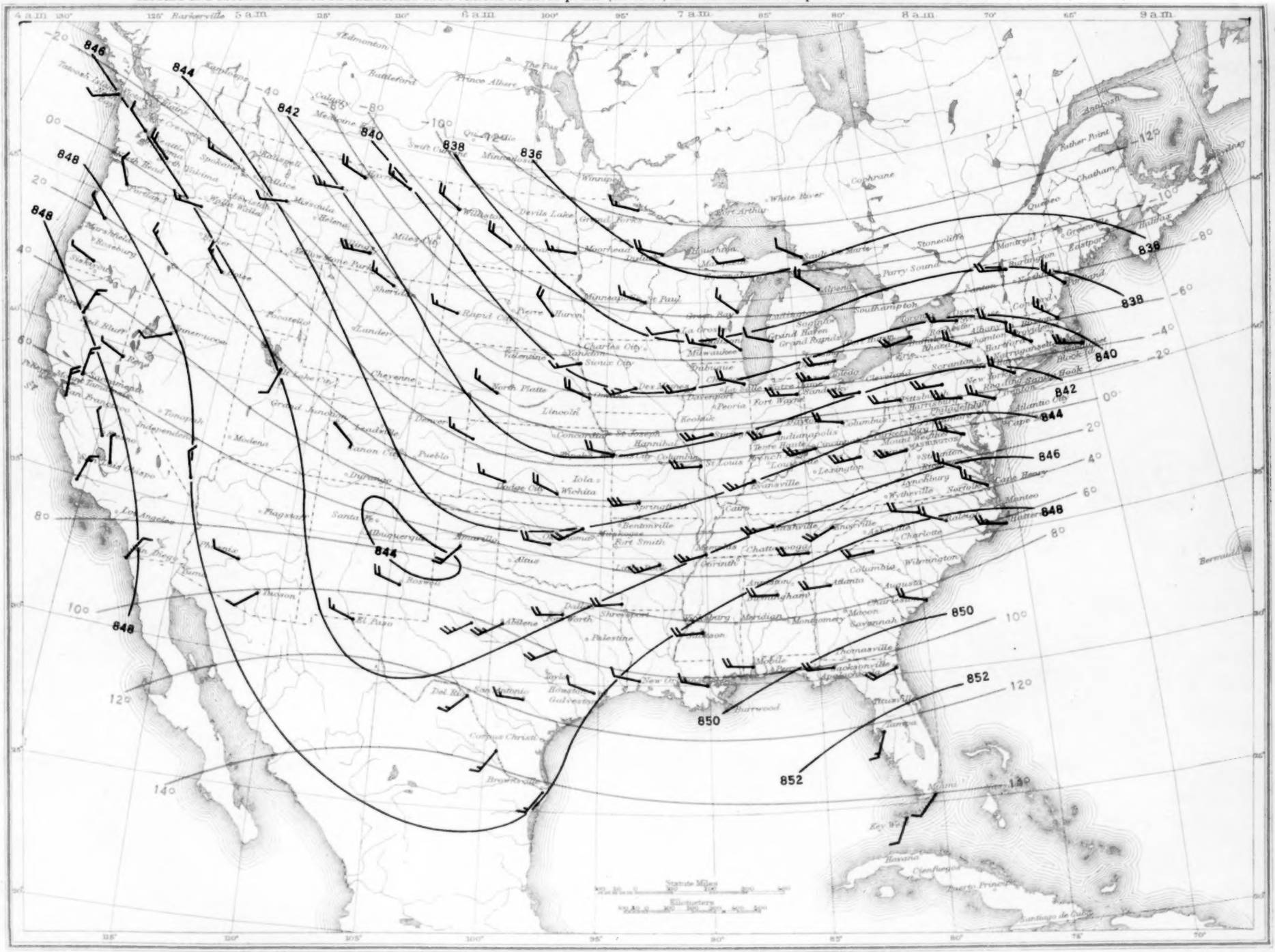


Chart VII. Total Snowfall, Inches, April 1944.

Chart VIII. Isobars (mb) for 1,524 Meters (5,000 ft.), and Isotherms (°C.), and Resultant Winds for 1,500 Meters (m. s. l.) March 1944

Isobars and Isotherms based on radiosonde observations at 11:00 p. m. (E. S. T.) and winds based on pilot-balloon observations at 5:00 a. m. (E. S. T.).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7 a.m.
8 a.m.
9 a.m.
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Edmonton
Battleford
Prince Albert
The Pas
Kamloops
Calgary
Medicine Hat
Swift Current
Minnedosa
Winnipeg
White River
Port Arthur
Cochrane
Quebec
Anticosti
Father Point
Chatham
Stonecliffe
Parry Sound
Montreal
Burlington
Portland
Eastport
Yellowstone Park
Miles City
Devils Lake
Grand Forks
Moorhead
Williston
Billings
Helena
Missoula
Spokane
Yakima
Walla Walla
Pendleton
Portland
Seattle
Tatoosh Island
Quillayute
Grays Harbor
Cape Blanco
Eureka
Red Bluff
Sacramento
San Francisco
Fresno
Pt. Reyes
Independence
Los Angeles
San Diego
Yuma
Tucson
Phoenix
Flagstaff
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Winnemucca
Reno
Salt Lake City
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Chevenne
Grand Junction
Denver
Leadville
Canon City
Pueblo
Dodge City
Wichita
Iola
Springfield
Bentonville
Fort Smith
Amarillo
Abilene
Fort Worth
Shreveport
Palestine
Houston
Galveston
Del Rio
San Antonio
Corpus Christi
Brownsville
Albuquerque
Santa Fe
Roswell
Tucumcari
Goodland
North Platte
Lincoln
Omaha
Sioux City
Yankton
Charles City
Valentine
Rapid City
Huron
Aberdeen
Pierre
Sheridan
Miles City
Billings
Havre
Glasgow
Minot
Williston
Devils Lake
Grand Forks
Moorhead
Fargo
Winnipeg
Kenora
Fort Frances
Port Arthur
White River
Sault Ste. Marie
Stonecliffe
Parry Sound
Montreal
Burlington
Portland
Eastport
Yarmouth
Halifax
Sydney
Anticosti
Father Point
Chatham
Quebec
Cochrane
Timmins
Sudbury
Toronto
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Buffalo
Rochester
Syracuse
Albany
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Hartford
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Nantucket
Hook
New York
Atlantic City
Cape May
Philadelphia
Harrisburg
Pittsburgh
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Detroit
Grand Rapids
Saginaw
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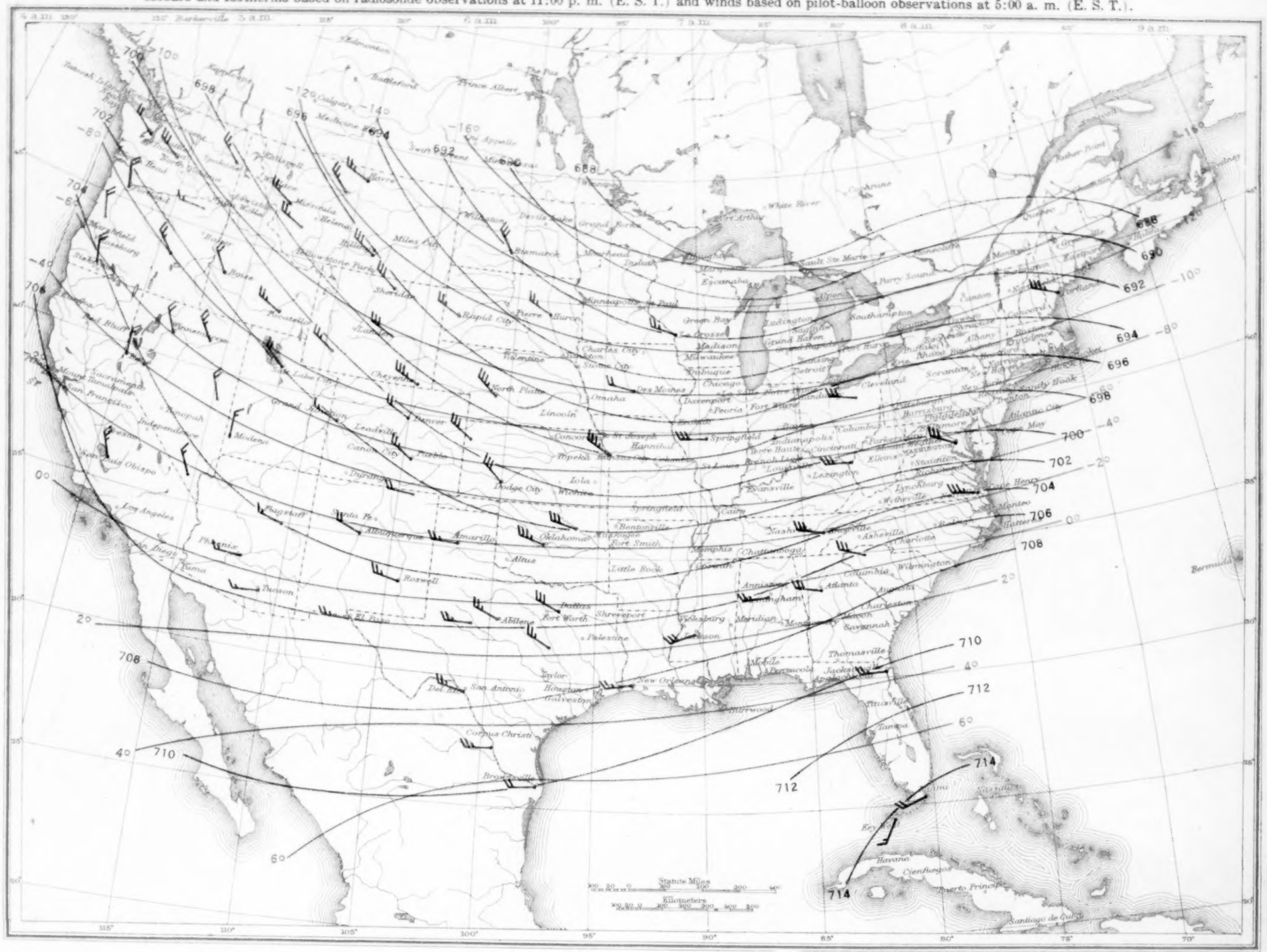
Nashville
Knoxville
Asheville
Charlotte
Greenville
Columbia
Wilmington
Atlanta
Augusta
Birmingham
Macon
Savannah
Montgomery
Meridian
Vicksburg
Jackson
Corinth
Chattanooga
Memphis
Little Rock
Fort Smith
Bentonville

Chart IX. Isobars (mb), Isotherms (°C.), and Resultant Winds for 3,000 Meters (m. s. l.) March 1944

Isobars and Isotherms based on radiosonde observations at 11:00 p. m. (E. S. T.) and winds based on pilot-balloon observations at 5:00 a. m. (E. S. T.).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712
714
-10°
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-14°
-16°
-8°
-6°
-4°
-2°
0°
2°
4°
6°
Statute Miles
Kilometers
Barkerville
Calgary
Medicine Hat
Battleford
Prince Albert
The Pas
Fort Arthur
White River
Sault Ste Marie
Parry Sound
Kapuskasing
Cochrane
Moosonee
Fort Appelle
Swift Current
Moose Jaw
Regina
Brandon
Winnipeg
Kenora
Port Arthur
Duluth
Minneapolis-St. Paul
Rochester
Green Bay
Milwaukee
Madison
Dubuque
Chicago
Detroit
Cleveland
Toronto
Ottawa
Montreal
Quebec
Fredericton
Moncton
Yarmouth
Halifax
Sydney
Charlottetown
Prince Rupert
Vancouver
Victoria
Seattle
Portland
Spokane
Lewiston
Boise
Helena
Butte
Missoula
Billings
Miles City
Williston
Bismarck
Devils Lake
Grand Forks
Fargo
Aberdeen
Pierre
Rapid City
Huron
Sheridan
Yellowstone Park
Cheyenne
North Platte
Omaha
Lincoln
Grand Island
Denver
Leadville
Pueblo
Canon City
Durango
Grand Junction
Salt Lake City
Ogden
Pocatello
Twin Falls
Reno
Winnemucca
Elko
Las Vegas
Mount Shasta
Sacramento
San Francisco
Fresno
Santa Cruz
San Luis Obispo
Los Angeles
Bakersfield
Independence
Flagstaff
Winslow
Prescott
Phoenix
Yuma
Tucson
Roswell
Santa Fe
Albuquerque
Amarillo
Oklahoma
Dodge City
Wichita
Topeka
Concordia
St. Joseph
Hannibal
Springfield
Iola
Fort Smith
Bentonville
Springfield
Cairo
Evansville
Indianapolis
Cincinnati
Louisville
Lexington
Columbus
Akron
Erie
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Sault Ste Marie
Escanaba
Marquette
Ironwood
Houghton
Duluth
Little Rock
Memphis
Nashville
Knoxville
Asheville
Charlotte
Greensboro
Raleigh
Wilmington
Hatteras
Norfolk
Richmond
Lynchburg
Roanoke
Bluefield
Charleston
Huntington
Parkersburg
Zanesville
Columbus
Dayton
Springfield
Indianapolis
Terre Haute
Peoria
Davenport
Rockford
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Marquette
Ironwood
Duluth
Minneapolis-St. Paul
Rochester
Dubuque
Waterloo
Fort Dodge
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Omaha
Lincoln
Grand Island
North Platte
Sheridan
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Miles City
Glasgow
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Dodge City
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Fort Worth
Dallas
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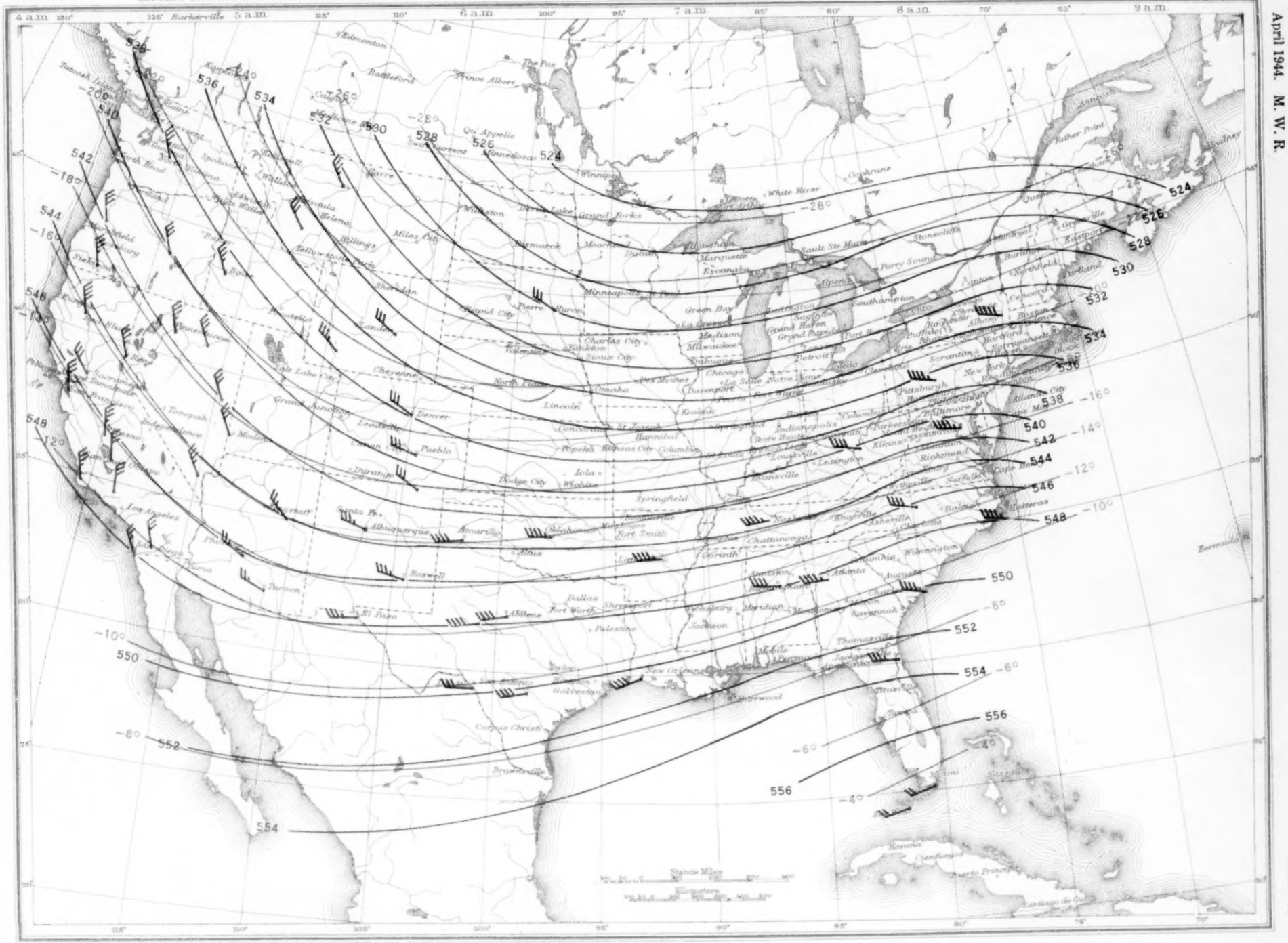
Meridian
Jackson
Mobile
Pensacola
Montgomery
Birmingham
Anniston
Atlanta
Augusta
Columbia
Charleston
Savannah
Thomasville
Jacksonville
Tampa
Miami
Key West
Havana
Cienfuegos
Puerto Principe
Santiago de Cuba
Bermuda
New Orleans
Houston
Galveston
Corpus Christi
Brownsville
Del Rio
San Antonio
Taylor
Palestine
Tyler
Texarkana
Monroe
Alexandria
Shreveport
Lake Charles
Beaumont
Port Arthur
Galveston
Hou

Chart X. Isobars (mb), Isotherms (°C.), and Resultant Winds for 5,000 Meters (m. s. l.) March 1944

Isobars and Isotherms based on radiosonde observations at 11:00 p. m. (E. S. T.) and winds based on pilot-balloon observations at 5:00 p. m. (E. S. T.).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Barkerville
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Prince Albert
The Pas
Winnipeg
White River
Cochrane
Sault Ste Marie
Parry Sound
Stonecliffe
Quebec
Sydney
Father Point
Yellowstone Park
Billings
Miles City
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Louisville
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Cincinnati
Memphis
Chattanooga
Atlanta
Birmingham
Montgomery
Meridian
Vicksburg
Jackson
New Orleans
Shreveport
Fort Worth
Dallas
Abilene
Galveston
Houston
Corpus Christi
Brownsville
San Antonio
Roswell
El Paso
Tucson
Los Angeles
San Francisco
Fresno
Tonopah
Independence
Modena
Winnemucca
Boise
Spokane
Walla Walla
Yakima
Seattle
Tatoosh Island
Quillayute
North Head
Eureka
Red Bluff
Sacramento
Point Reyes
Blue Canyon
Ely
Havre
Williston
Devils Lake
Grand Forks
Moorhead
Duluth
Marquette
Escanaba
Green Bay
Milwaukee
Madison
Grand Haven
Saginaw
Port Huron
Toronto
Kingston
Oswego
Albany
Harrisburg
Williamsport
Philadelphia
Wilkes-Barre
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Buffalo
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Akron
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Dayton
Cincinnati
Huntington
Elkins
Roanoke
Lynchburg
Norfolk
Cape Henry
Hatteras
Raleigh
Asheville
Charlotte
Greenville
Augusta
Columbia
Savannah
Jacksonville
Thomasville
Tallahassee
Pensacola
Mobile
Meridian
Vicksburg
Monroe

Chart XI. Isobars (mb), Isotherms (°C.), and Resultant Winds for 10,000 Meters (m. s. l.) March 1944

Isobars and Isotherms based on radiosonde observations at 11:00 p. m. (E. S. T.) and winds based on pilot-balloon observations at 5:00 p. m. (E. S. T.).

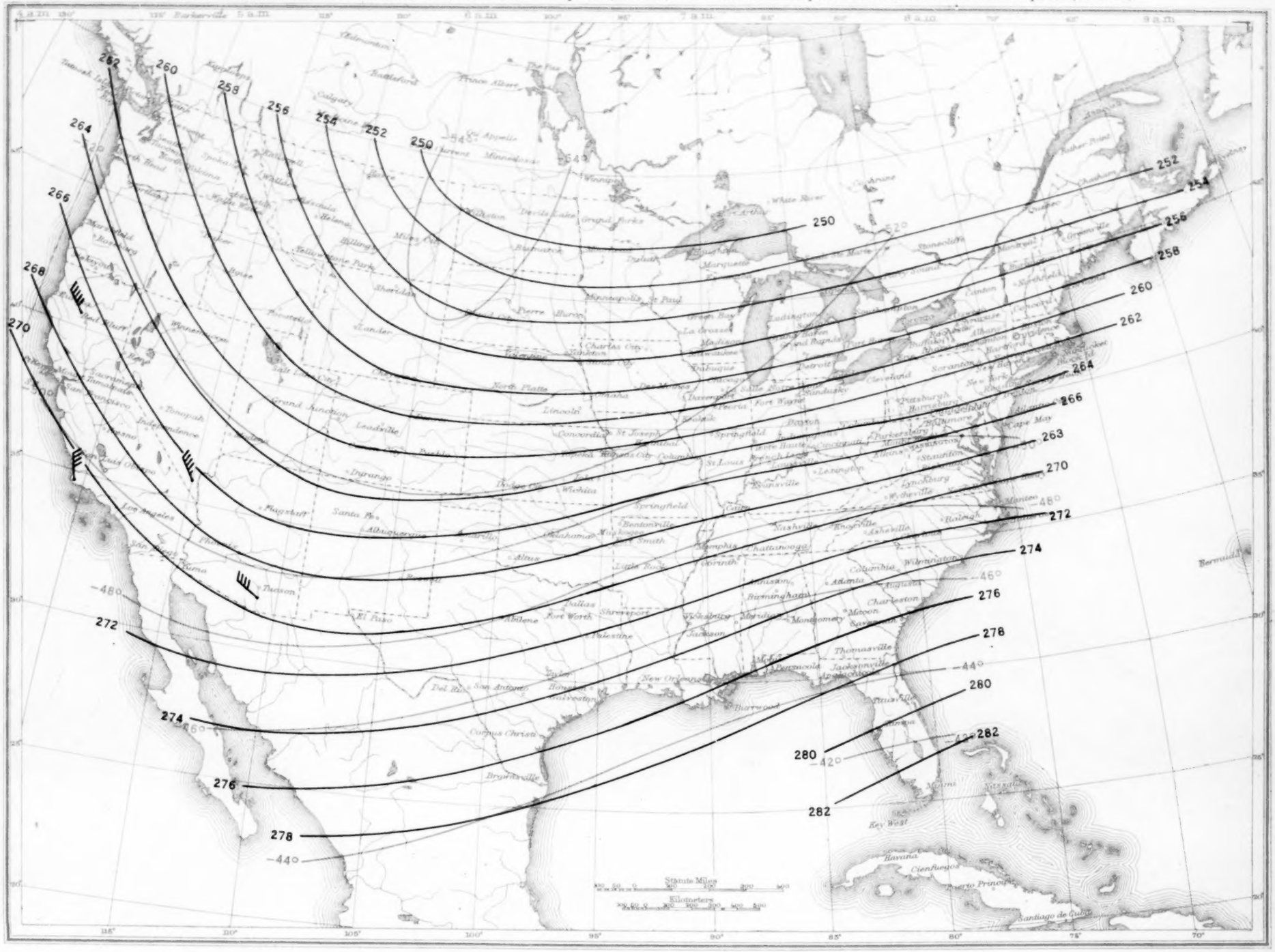


Chart VIII. Isobars (mb) for 1,524 Meters (5,000 ft.) and Isotherms (°C.) and Resultant Winds for 1,500 Meters (m. s. l.) April 1944

Chart VIII. Isobars (mb) for 1,524 Meters (5,000 ft.), and Isotherms (°C.), and Resultant Winds for 1,500 Meters (m. s. l.) April 1944

Isobars and Isotherms based on radiosonde observations at 11:00 p. m. (E. S. T.) and winds based on pilot-balloon observations at 5:00 a. m. (E. S. T.).

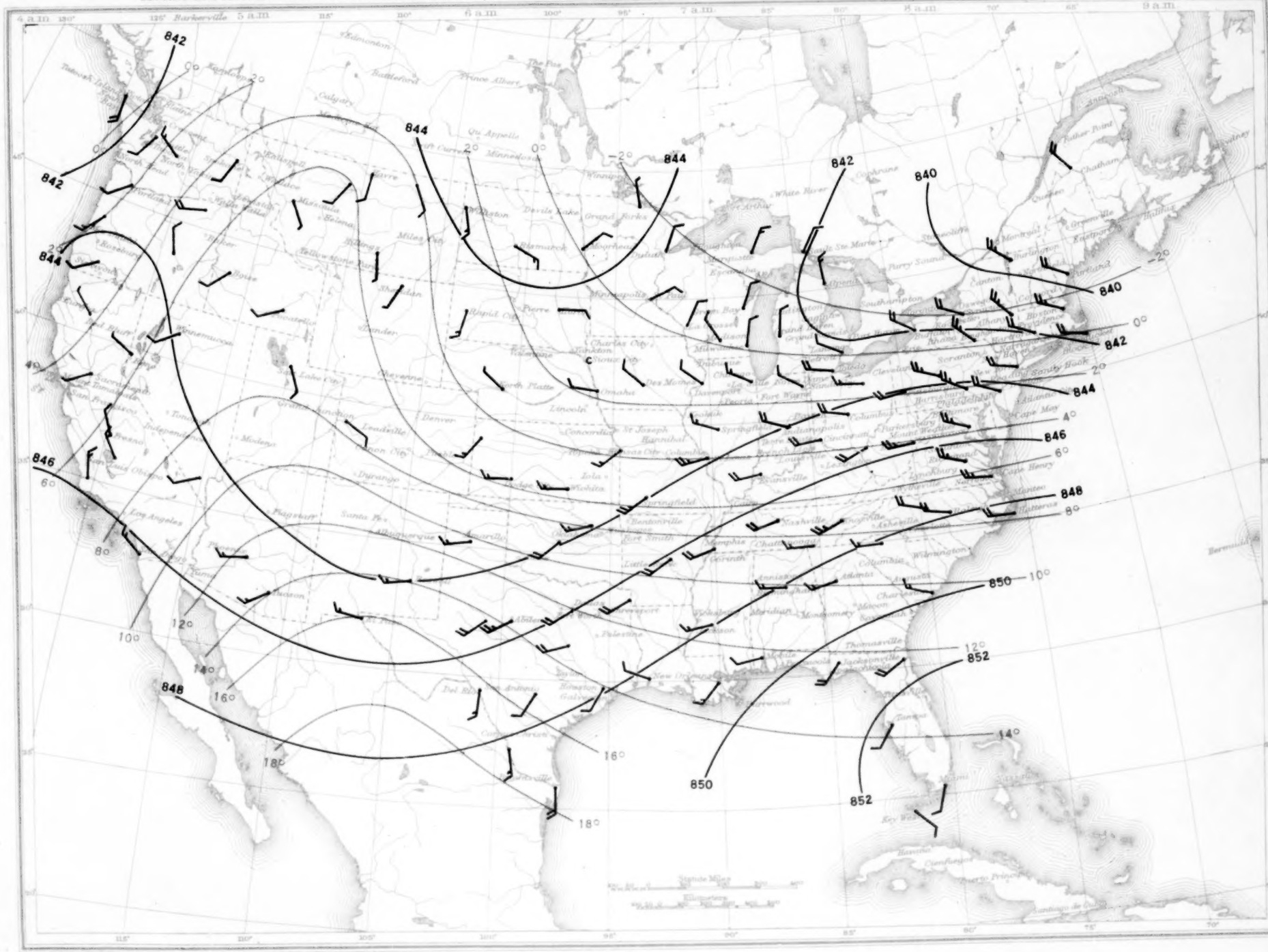


Chart IX. Isobars (mb), Isotherms (°C.), and Resultant Winds for 3,000 Meters (m. s. l.) April 1944

Isobars and Isotherms based on radiosonde observations at 11:00 p. m. (E. S. T.) and winds based on pilot-balloon observations at 5:00 a. m. (E. S. T.)

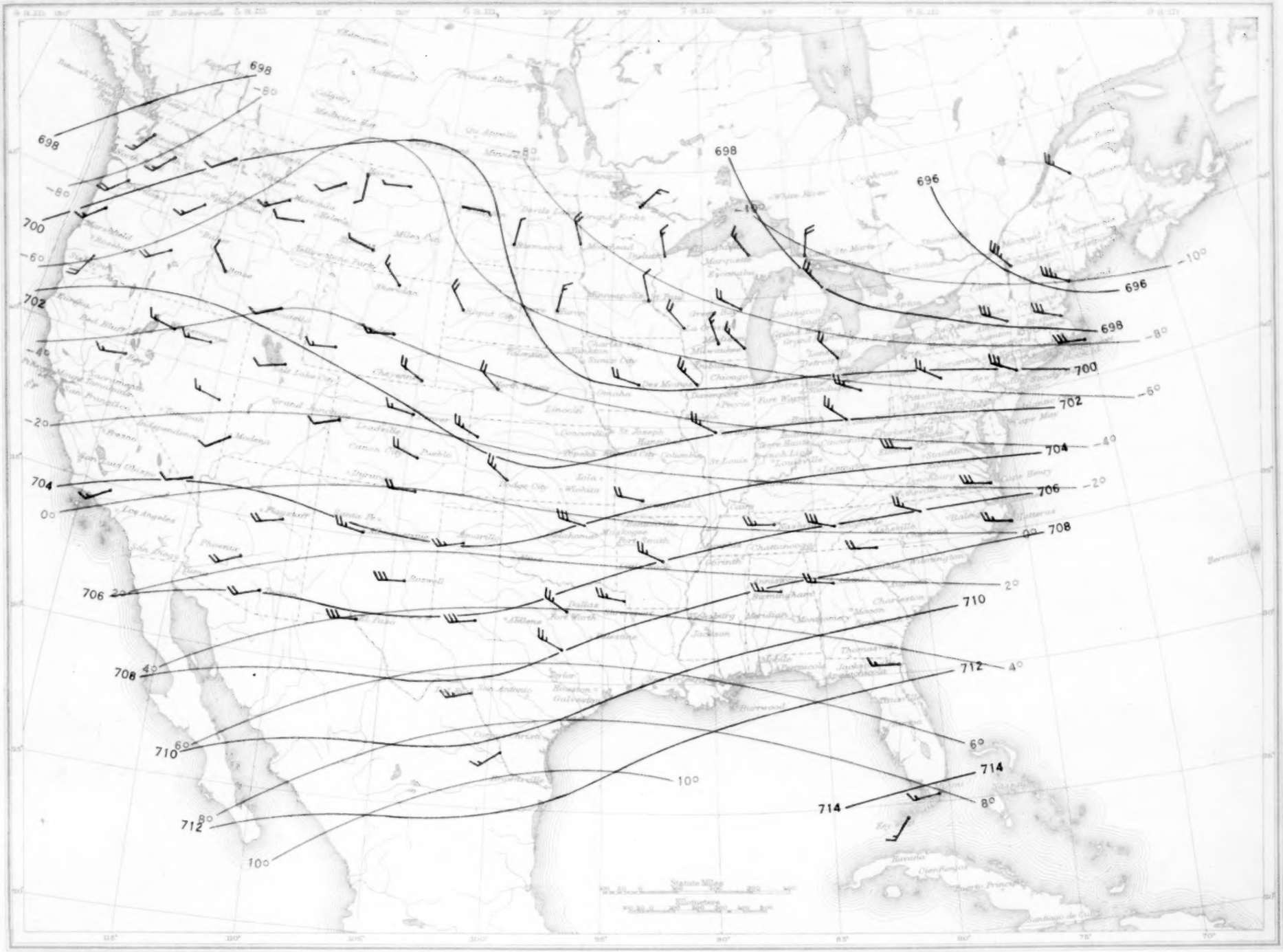


Chart X. Isobars (mb), Isotherms (°C.), and Resultant Winds for 5,000 Meters (m. s. l.) April 1944

Isobars and Isotherms based on radiosonde observations at 11:00 p. m. (E. S. T.) and winds based on pilot-balloon observations at 5:00 p. m. (E. S. T.).

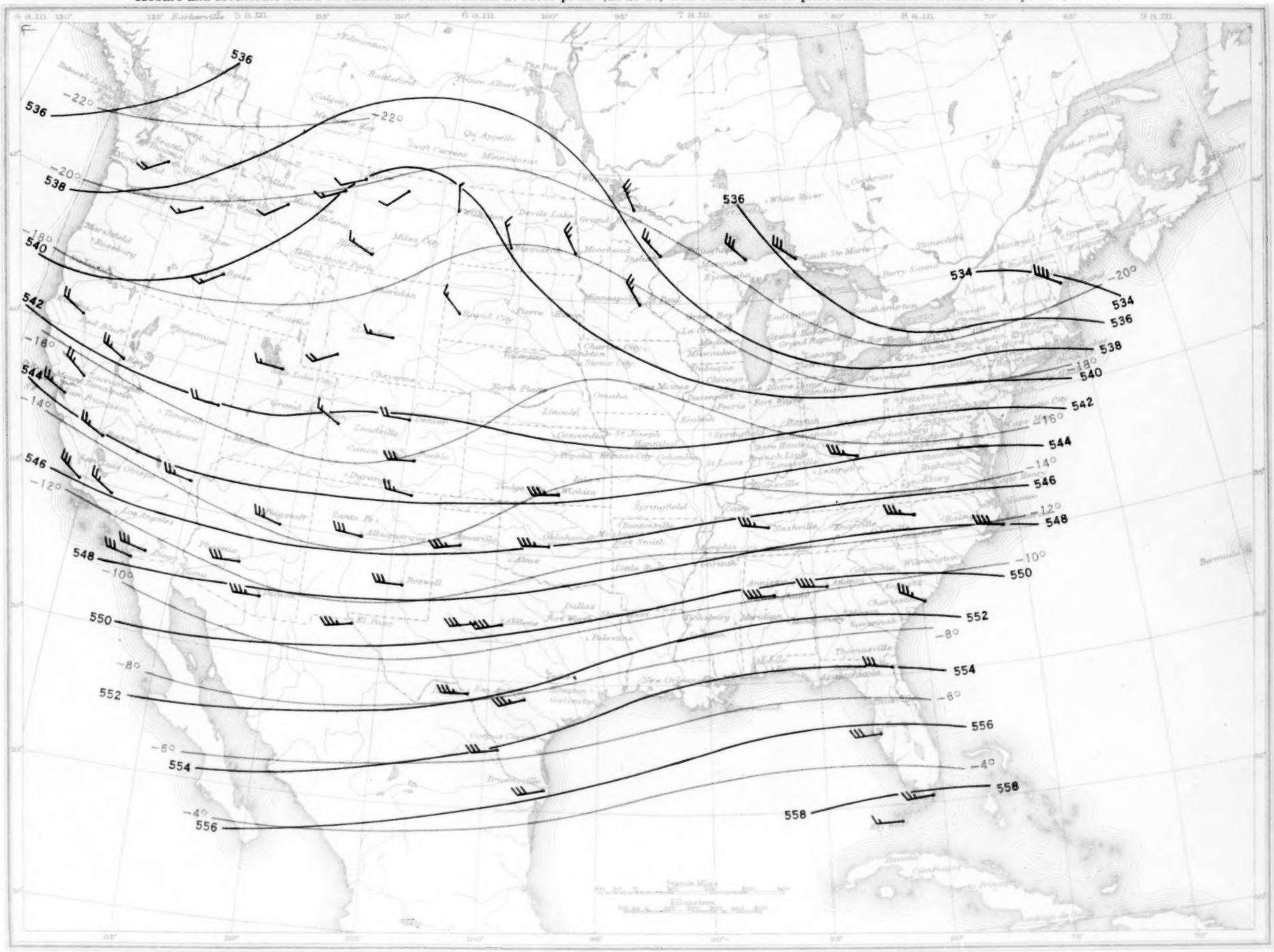
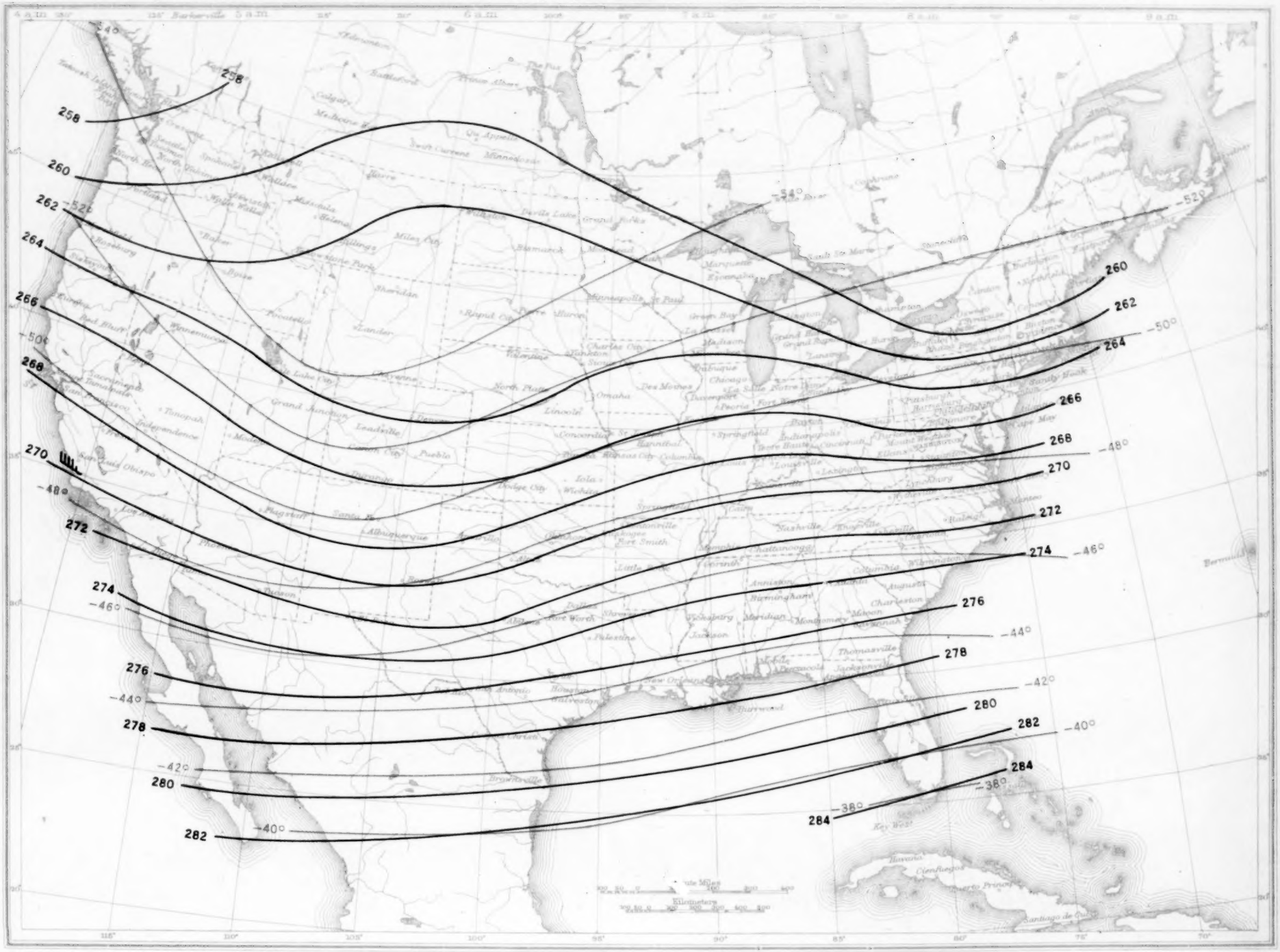


Chart XI. Isobars (mb), Isotherms (°C.), and Resultant Winds for 10,000 Meters (m. s. l.) April 1944

Isobars and Isotherms based on radiosonde observations at 11:00 p. m. (E. S. T.) and winds based on pilot-balloon observations at 5:00 p. m. (E. S. T.).